

BID SOLICITATION NOTICE

TO RECEIVE A BID PACKAGE, BIDDERS MAY EITHER DOWNLOAD THE REQUEST FOR BIDS ("RFB") FROM THE AUTHORITY'S WEBSITE AT <http://www.state.nj.us/turnpike/purchasing.html> OR REQUEST A BID BY COMPLETING THIS FORM AND FAXING IT TO THE NUMBER STATED BELOW. FOR RECORD KEEPING PURPOSES, THE AUTHORITY REQUESTS THAT THE BIDDER COMPLETE THIS FORM AND RETURN IT TO THE PROCUREMENT AND MATERIALS MANAGEMENT DEPARTMENT, EVEN WHEN A BIDDER IS DOWNLOADING THE RFB. THIS IS THE ONLY NOTICE OF BIDDING FOR THE FOLLOWING GOODS.

THE NEW JERSEY TURNPIKE AUTHORITY PROCUREMENT AND MATERIALS MANAGEMENT DEPARTMENT

New Jersey Turnpike Administrative Offices
P.O. Box 5042, 581 Main Street
Woodbridge, New Jersey 07095-5042
Tel. - 732-750-5300 Ext. 8640 Fax - 732-750-5399

TITLE: **GENERATORS**
BID NO: **R-121433, R-121436, R-121437**
DUE DATE: **2-9-16**
TIME: **11:30 AM**

SUBMIT BIDS BEFORE THE DUE DATE AND TIME STATED ABOVE TO THE ABOVE ADDRESS

BIDDER INFORMATION (PLEASE PRINT)

NAME OF BIDDING ENTITY

ADDRESS

CITY, STATE AND ZIP CODE

E-MAIL ADDRESS

REPRESENTATIVE TO CONTACT-NAME & TITLE

TELEPHONE NO

FEDERAL TAX I.D. NO. or TAXPAYER I.D. NO

FAX NO

☐

WE HAVE DOWNLOADED THE BID FROM THE AUTHORITY WEBSITE

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PROCUREMENT AND MATERIALS MANAGEMENT DEPARTMENT**

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FAX NO

_____ BUSINESS CORPORATION _____ PARTNERSHIP _____ INDIVIDUAL

_____ OTHER (SPECIFY) _____

SECTION I

A. INTRODUCTION

The New Jersey Turnpike Authority (the “Authority”) was created by an act of the New Jersey Legislature in 1948, known as the New Jersey Turnpike Authority Act (as amended and supplemented, “Act”). The Act authorizes the Authority to construct, maintain, repair, and operate the New Jersey Turnpike, to collect tolls, and to issue Turnpike Revenue Bonds or Notes, subject to the approval of the Governor, payable from tolls and other revenues of the Authority. On May 27, 2003, the Act was amended to empower the Turnpike to assume all powers, rights, obligations and duties of the New Jersey Highway Authority (the “Highway Authority”), which owned and operated the Garden State Parkway and PNC Bank Arts Center. On July 9, 2003, the Authority assumed all powers, rights, obligations and duties of the Highway Authority. The Authority currently operates both the Garden State Parkway (“GSP”) and the New Jersey Turnpike (“Turnpike”) (both roads are collectively referred to herein as the “Roadways”).

The Authority is governed by an eight member Board of Commissioners (“Board”). The Governor of New Jersey appoints each of its members and has the statutory authority to overturn an action of the Board by vetoing any Board action within 10 days of receiving the minutes of the meeting. The Board authorizes awards of all public contracts over \$35,000, except in cases where it has delegated authority to the Executive Director.

This bid solicitation is being conducted pursuant to the Authority’s enabling statute as found in N.J.S.A. 27.23-6.1 and Executive Order number 37 (Corzine 2006) and the regulations and policies of the Authority with regard to public bid procurement.

B. BIDDER GUIDELINES/CHECKLIST

BIDS THAT FAIL TO CONFORM TO THE FOLLOWING REQUIREMENTS MAY BE REJECTED:

1. The Request for Bids ("RFB"), including specifications and related bid documents ("Bids") must be received at or before the due date and time stated on the cover page at the following place: New Jersey Turnpike Authority, Administration Building, 581 Main Street, Woodbridge, New Jersey 07095. Late Bids will be returned unopened. Telephone or facsimile Bids will not be accepted.
2. The entity submitting a Bid ("Bidder") must provide one original and one copy of the Bid. The Bid must include all price information. Bid prices shall include delivery of all items F.O.B. destination or as otherwise provided. Price quotes must be firm through issuance of contract.
3. All Bid prices must be typed or written in ink. Quote the specified unit of measure. If bidding an alternate, provide detailed specifications.
4. All corrections, white-outs, erasures, re-striking of type, or other forms of alteration or the appearance of alteration, to unit and/or total prices must be initialed in ink by the Bidder.
5. The Bidder must attend the mandatory site inspection at the following date(s) and time(s) if applicable:
6. If checked this RFB requires the following mandatory document(s) or the Bid **will** be rejected:
 - (a) Bid Bond or Cashier's Check for 10% of the amount Bid or a Letter of Surety ☒
 - (b) Stockholder/Partnership Disclosure Statement ☒
7. See the Authority's Instruction to Bidders for a complete list of the Authority's standard contract Terms and Conditions, as well as required forms that must be included with the Bid (**ATTACHED**).

The following checked documents are required for this Bid. Failure to submit the required forms may result in the rejection of the Bid.

- (a) State of New Jersey Division of Revenue Business Registration Certificate ☒
 - (b) Certification of Registration with the Secretary of State (only if non-NJ corporation) ☒
 - (c) Acknowledgement of requirement for Disclosure of Political Contributions (ELEC) ☒
 - (d) Public Works Contractor Registration Certificate(s) (if applicable) ☐
 - (e) Affirmative Action Information Sheet with Certificate or Form AA302 ☒
 - (f) Signed Mandatory Equal Employment Opportunity Language ☒
 - (g) SBE/WBE/MBE Certificates and Form ☒
 - (h) Vendor Disclosure Form (EO129-Location of Services) ☒
 - (i) Notice of Set-Off for State Tax (P.L. 1999, c 159) ☒
 - (j) Automobile Insurance Liability Waiver ☐
 - (k) Insurance Certificate ☒
 - (l) Disclosure of Investment in Iran ☒
8. Bidder must sign Bid ☒
 9. Three year Open Option Clause ☒

SECTION II

A. INTENTION

1. Sealed Bids for **R-121433, R-121436, R-121437** must be received at the New Jersey Turnpike Authority Administrative Offices, 581 Main Street, Woodbridge, New Jersey 07095-5042, by the due date and time stated on the cover page of this “RFB” at which time and place said Bid will be opened and read in public.
2. Bidders mailing Bids should allow for their normal mail delivery time to ensure timely receipt of the Public Bids. **Please be advised that using an overnight/next-day delivery service does not guarantee overnight/next-day deliveries to our location. The Authority will not be responsible for any Bid not being received by the required date and time.**
3. It is the intention of the Authority to issue a purchase order or notice of award for a price agreement for the procurement of **GENERATORS AND ACCESSORIES AS PER Attached Specifications.**
4. Items purchased under this contract will be delivered as directed by the Authority.
5. Please contact Richard Bava with any questions regarding this procurement at 732-750-5300 x-8636, or rbava@turnpike.state.nj.us.

B. BID SHEET INSTRUCTIONS

1. Bidders must follow all instructions in this RFB and in the Instructions to Bidders issued by the Authority, and any other documents issued by the Authority in connection with this RFB (collectively, “Bid Documents”).
2. Bidders must examine the bid documents carefully before bidding and must ask the Director of Procurement and Materials Management Department (“PMM”) in writing for any interpretation or correction of any apparent ambiguity, inconsistency or apparent error therein. If necessary, an interpretation or correction to the specifications shall be issued by the Director of PMM in response to inquiries and/or addendum shall be faxed to Bidders who have obtained the Bid Documents. Upon the issuing of an addendum, the addendum shall become part of the bid documents. **Requests for interpretation or correction shall be considered only if received at least 5 business days prior to the Bid opening date.**
3. Written requests can be submitted by FAX at 732-750-5399.
4. The submission of the Bid is conclusive evidence that the Bidder is fully aware of the conditions, requirements, and details as stated in the Bid Documents. If the Bidder, prior to submitting its Bid, fails to notify the Director of PMM of the existence of an ambiguity or inconsistency in the Bid Documents, a Bid will conclusively be

presumed to have been based upon the Authority's interpretation of such ambiguity or inconsistency.

5. All erasures, interpolations or other physical changes on the Bid form shall be signed or initialed by the Bidder. Bids containing any conditions, omissions, erasure's, alterations, or items not called for in this "RFB" or irregularities of any kind, may be rejected by the Authority, in its sole discretion.

The Bidder shall not attach conditions, limitations or provisos to their Bid, except in cases where "exceptions" are permitted.

6. **The Authority will accept Approved Equivalent items on this Bid.** If a Bidder is basing the proposal on items other than what is specified, and wishes the items proposed to be considered as an "Approved Equivalent", the Bidder shall enter a price on the Bid sheet then submit on the Exception Sheet in the exact format of the line item on the RFB contained herein, the item number, an item description including manufacturers name, model number, informational brochure(s), and packaging quantities of those items that the Bidder proposes to substitute.

C. BASIS OF AWARD

1. **Bidders must supply a price for every item listed. Bids not having a price for all listed items may be rejected.**
2. **Bidders must quote only one price per line item. If a Bidder quotes multiple prices per line item, the Bid may be rejected.**
3. The Authority will purchase amounts of any given item as needed, at the sole discretion of the Authority and shall not be bound by any quantities listed. The Authority reserves the right to make reasonable increases or decreases to line item quantities.
4. All items are to be Bid FOB Destination. All shipping, handling, and other costs should be considered in the Bid price.
5. The Authority is tax exempt from New Jersey Sales and Excise Tax.
6. Award will be made to the lowest responsive Bidder for the Total line items Bid.

D. MISCELLANEOUS

1. Delivery Date _____
(Insert if applicable)

2. Payment Terms: The Authority's standard payment terms are Net 30 days. Prompt payment discounts may be offered and must be a minimum of 10 days.

3.
Discount: Maximum time period: _____ Percentage: _____

Note: Although prompt payment discounts will not be considered in determining low Bid, the Authority reserves the right to take advantage of any such discounts offered.

BID PRICE SHEET

| ITEM | QTY | UNIT | DESCRIPTION | UNIT PRICE | TOTAL DOLLAR AMOUNT |
|-------------------------------|-----|------|--|------------|---------------------|
| 1 | 1 | EA | <u>100 KW NATURAL GAS-POWERED GENERATOR AND ACCESSORIES, as per attached Specifications (page 12)</u> | \$ | \$ |
| 2 | 1 | EA | <u>100 KW DIESEL-POWERED GENERATOR AND ACCESSORIES, as per attached Specifications (page 30)</u> | \$ | \$ |
| 3 | 3 | EA | <u>80 KW DIESEL-POWERED GENERATOR AND ACCESSORIES, as per attached Specifications (page 52)</u> | \$ | \$ |
| <u>TOTAL BID PRICE</u> | | | | | \$ |

**ANY INQUIRIES CONCERNING THIS BID MUST BE SENT VIA FAX TO 732-750-5399
NO LATER THAN FIVE (5) BUSINESS DAYS BEFORE BID OPENING**

NEW JERSEY TURNPIKE AUTHORITY

Andrea E. Ward
Director, PMM Department

Name of Company

Authorized Signature of Bidder

E. SIGNATURE PAGE

1. **ADDENDA / INQUIRIES:** COMPLETE (if applicable) BEFORE SUBMITTING BID:

Receipt of Addendum/Inquiries # _____ dated _____ is hereby acknowledged.

Receipt of Addendum/Inquiries # _____ dated _____ is hereby acknowledged.

☐

CHECK BOX IF NO ADDENDA/INQUIRY ISSUED

(All Addenda / Inquiries must be acknowledged as indicated above.)

2. **BID IRREVOCABLE:** This offer shall be irrevocable for ninety (90) working days after the date on which the Authority publicly opens this Bid except in those instances where an unsuccessful Bidder has filed a bid protest pursuant to N.J.A.C. 19:9-2.12. Upon notification of a protest, Bidders are required to hold their prices for an additional 90 days. All Bidders will be notified in writing of the action taken by the Authority.
3. **OFFER/CERTIFICATION:** The undersigned offers and agrees to furnish to the New Jersey Turnpike Authority the services and/or materials in compliance with all terms, conditions, specifications and addenda of the RFB, Bid Documents, and resulting contract. The undersigned further certifies understanding and compliance with the requirements of the standard terms and conditions as stated in the Instructions to Bidders included with the Bid Documents. The undersigned certifies that he or she executes this Bid with full authority so to do; and that all statements contained in this Bid and in this certification are true and correct, and made with full knowledge that the Authority relies upon the truth of the statements contained herein and in any statements requested by the Authority showing evidence of qualifications in awarding the contract.

I certify that the foregoing statements made by me are true. I am aware that if any of the foregoing statements made by me are willfully false, I am subject to punishment.

4. **AUTHORIZED SIGNATURE:** _____

Print Name and Title: _____

Bidder: _____

Address: _____

City _____ State _____ Zip: _____

E-mail address: _____

Telephone #: _____ Fax #: _____

Date: _____

SECTION III

NO RESPONSE BID SURVEY

BID NUMBER: R-121433, R-121436, R-121437

BID TITLE: GENERATORS AND ACCESSORIES

If you do not choose to respond to this Bid, please complete the form below:

Name of Company_____

Reason you did not respond (Check all that apply):

_____ Cannot supply product or service

_____ Cannot meet technical specifications

_____ Cannot meet delivery specifications

_____ Cannot meet legal requirements
(i.e. Bid/performance/security/insurance, etc.)

_____ Cannot provide a competitive price at this time

_____ Interested in receiving specifications for informational purposes only

_____ Insufficient lead time to respond

_____ Other:(please be specific) _____

_____ Do you wish to remain on our mailing list?

_____ Yes _____ No

Additional comments: _____

Signed (optional): _____

Company: _____

ADDITIONAL YEARS PURCHASING OPTION, for R-121433, R-121436, R-121437

BID TITLE: GENERATORS AND ACCESSORIES

3 - Year Open End Option: The Authority shall have the option for one (1) Model Year* from the date of Contract, to order additional units conforming to the requirements of these specifications at the same price and under the same terms and conditions as those contained herein.

The Authority shall further have the option to purchase additional units conforming to these specifications for two (2) additional Model Years. Any unit(s) offered during the two (2) subsequent Model Years shall be of the model equivalent to that specified herein. In the latter instances, if there have been any price changes, the vendor shall submit a request to the Authority covering the aforesaid price changes, and shall include appropriate explanation and justification for any such price changes.

Any such request for price adjustment shall be in writing and directed to the Director, Procurement and Materials Management Department and shall be accompanied by the following evidence as a basis for your request;

1. The published price lists for equipment, which were in effect at the time of your original proposal.
2. The equivalent published price lists in effect at the time of your request.
3. Any additional evidence which the Authority deems necessary in the evaluation of your request.

The Authority shall, within its sole discretion, have the right to accept the price changes proposed by the vendor or if it so desires, re-bid the requirement.

*Model Year is defined as the Model Year of the Manufacturer of the unit(s) offered by you in this Request for Quotation. In that instance where proposals are for equipment for which “Model Year” and “Production Cut-Off Dates” are undefined or non-existent, the “Model Year” is defined, for bid purposes, as one calendar year from the date on which the Contract is accepted. The last date on which orders may be placed for the Model currently in effect is_____.

NEW JERSEY TURNPIKE AUTHORITY

GENERAL INSTRUCTIONS AND SPECIFICATIONS FOR: STAND-BY 100 KW NATURAL GAS POWERED GENERATOR AND ACCESSORIES

| Quantity | Description | Required Delivery Date |
|----------|---|---------------------------------|
| 1 | Stand-by 100 KW Natural Gas Powered Generator and Accessories | 120 Days After Receipt of Order |

SPECIFICATIONS: SBNGPG-2016 STAND-BY 100 KW NATURAL GAS POWERED GENERATOR AND ACCESSORIES

COMPLIANCE WITH RULES AND REGULATIONS: The unit must meet all current OSHA, ANSI, PEOSHA, NFPA 99, NFPA 110, National Electrical Code, and all other applicable regulations. The New Jersey Turnpike Authority reserves the right to request certification indicating the unit bid has been certified and tested to meet these requirements with proper documents attesting to said Certification.

ENERGY STAR REQUIREMENTS: If applicable for items specified in bid package, the vendor must provide products that earn ENERGY STAR and meet the ENERGY STAR specifications for energy efficiency. The vendor is encouraged to visit energystar.gov for complete product specifications and updated lists of qualifying products. The ENERGY STAR label must also be affixed to each delivered item. The bidder's signature on the signature page certifies that items so indicated that have earned ENERGY STAR and meet the ENERGY STAR specifications or other standards for energy efficiency will be supplied.

ERRORS AND OMISSIONS: Inadvertent omissions or errors in the attached specifications must be brought to the attention of the New Jersey Turnpike Authority's Director of Procurement and Materials Management at 732-750-5300 before bid submission date. If, with knowledge of such error or omission and prior to the correction thereof, the bidder proceeds with any work affected hereby, they shall do so at their own risk and the work so done shall not be considered as work done under and in performance of this Agreement unless and until approved and accepted.

DELIVERY INSTRUCTIONS:

- A. Vendor must contact Peter Perperas (Project Supervisor) at 732-442-8600 ext. 2868 for authorization to schedule date and time prior to delivery. Any work that needs to be completed including all pre-delivery preparation shall be done prior to delivery.
Deliveries shall be made to the NJTA Garden State Parkway Division Telegraph Hill Maintenance Facility located at GSP Exit 116 in Holmdel, NJ 07733.

- B. Vendor shall be responsible for all delivery, shipping and pick-up expenses.
- C. All units must be pre-delivery serviced, completely assembled, operational, and cleaned prior to delivery.
- D. The following administrative package **must** accompany all deliveries:
 - **Invoice:** purchase order number must be displayed on invoice. Invoice shall have current date and be hand delivered to Peter Perperas (400 King Georges Post Rd Woodbridge, NJ 07095) after final acceptance of complete order.
 - Warranty forms properly executed.
 - Four (4) keys for each unit shall be furnished. **NO EXCEPTIONS**
 - **Generator and Transfer Switch must be delivered at the same time. NO EXCEPTIONS**

WARRANTY: All units delivered must be guaranteed to be free from defects in materials, design and workmanship for a minimum of one (1) year with an additional warranty of four (4) years parts and labor from the time of acceptance by the New Jersey Turnpike Authority. All warranties shall start upon written acceptance of units by the New Jersey Turnpike Authority. Warranty must include service availability from any manufacturers authorized dealer establishment most closely located to Parkway and Turnpike area. This repair facility may not be further than 100 miles from the Central Maintenance Facility in Holmdel, NJ 07733 or the Central Shops Maintenance Facility located in Hightstown, NJ 08520. If warranty service is required, the vendor who supplied the unit shall provide for pickup, delivery and repair of unit at no charge to the New Jersey Turnpike Authority. The vendor shall also have a program to include an in-house warranty. All warranty periods shall start from date of acceptance of unit by the New Jersey Turnpike Authority.

EXCEPTION SHEET: Exception sheet is furnished with each set of specifications. Bidders making exceptions must note exceptions by item and indicate substitution in lieu and submit with bid, detailed specifications on the substitution. If the vendor is submitting an alternate product, component, feature or part to what is referenced in the specifications, the proposals **must** be accompanied by descriptive literature, marked and indicate the exact items to be furnished, with an engineering drawing of the same. **Failure to supply information requested may result in rejection of bid.** Where no exception is taken, the word "None" shall be neatly printed or typed on the exception sheet. **Failure to supply information and/or failure to complete the bidder's exception spaces in the prescribed manner may disqualify bid. It shall be understood that if no exception is taken, the vendor shall supply all material exactly as specified. No substitution will be permitted after receipt of bids.**

MANUFACTURER'S PRODUCTION SHEET: The vendor shall furnish one (1) copy of the actual Factory Production Sheet for each unit provided. The copies of the Factory Production Sheet shall be submitted at the time of the Authority's inspection of the unit.

TRAINING: It shall be the responsibility of the successful bidder to supply all safety, operational and service training to New Jersey Turnpike Authority personnel in accordance with all applicable ANSI and OSHA regulations. The safety and operational training shall consist of a complete review and understanding of the manufacturer's owner manual, along with actual operation of equipment. The instructor shall emphasize all proper uses for safe operation. The training shall include but not limited to all general troubleshooting of the hydraulic system and associated electronics. The instructor shall also emphasize the proper use of tools and test equipment along with general shop safety. The service seminars shall be similar to factory and manufacture type schools. The training shall be scheduled and take place at one (1) site designated by the New Jersey Turnpike Authority.

LABELS: Plastic stick-on labels shall not be acceptable.

ADVERTISEMENTS: No Dealer advertisements shall appear on unit or any other related equipment.

ACCESSORIES: All accessories shall be manufacturer installed when the item is available from the manufacturer.

FACILITIES: Bidders shall represent a manufacturer, which has in operation a factory adequate for the manufacture of the equipment, which it proposes to furnish. The manufacture(s) whose associated equipment or products are bid shall have a full service warranty and parts supply facility that can guarantee availability of parts within 24 hours after telephone order and shall be located within a 100 mile radius of either Central Shops Maintenance Facility (exit 8 on the NJ Turnpike) located in Hightstown, NJ 08520 or Telegraph Hill Maintenance Facility (exit 116 on the GSP) located in Holmdel, NJ 07733. This facility will be required to establish an in-house warranty program and provide all warranty work related to the equipment in the bid proposal. The bidder shall submit the locations, names and telephone numbers of people who are authorized to service the equipment or who can be reached for emergency service.

Location_____

Phone #_____

Contact_____

Name & Title

**SPECIFICATIONS: SBNGPG-2016
STAND-BY 100 KW NATURAL GAS POWERED GENERATOR
AND ACCESSORIES**

INTENT: The intent of this specification is to describe and govern the purchase of one (1) Stand-By 100 KW Natural Gas Powered Generator and Accessories. The components including the completed unit shall be new and of the latest design and be in current production at the time of the submission of bid. No bid shall be considered unless the vendor submitting the bid can meet the following conditions. All standard and optional equipment shall be Original Equipment Manufacturer (OEM) items, when available. **NO EXCEPTIONS**

NOTE: The natural gas powered generator shall be designed with the specific criteria below. Generator shall run a minimum of twenty-four (24) hours at 100% load.

(1) Generator—120/208 voltage, 3-phase 4-wire, with enclosure.

(1) Automatic Transfer Switch 120/208 volt, 400 amps, 3 phase, 4 wire with solid neutral and NEMA 4X enclosure.

BIDDER'S INSTRUCTIONS

IT SHALL BE THE BIDDER'S RESPONSIBILITY TO CAREFULLY EXAMINE EACH ITEM OF THE SPECIFICATION. BIDDERS MUST INDICATE WHETHER THEY COMPLY OR NON-COMPLY FOR EACH LINE ITEM IN THE SPECIFICATION. FAILURE TO PROVIDE A COMPLETED BID MAY CAUSE REJECTION OF BID. ALL NON-COMPLY RESPONSES AND/OR BIDDERS PROPOSED "APPROVED EQUIVALENTS" MUST BE FULLY EXPLAINED ON EXCEPTION FORM, NOTING SECTION AND ITEM. FAILURE TO EXPLAIN NON-COMPLY RESPONSES OR FAILURE TO SUPPLY DETAILED LITERATURE/BROCHURES ON THE BIDDERS PROPOSED "APPROVED EQUIVALENTS" MAY CAUSE REJECTION OF BID. WHERE "MINIMUM/MAXIMUM" IS SPECIFIED, BIDDERS MUST PROPOSE AT LEAST THE MINIMUM/MAXIMUM SIZES OR THE BID MAY BE REJECTED.

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| SUBMITTALS: | | |
| A. The contractor shall furnish data showing manufacturer's model numbers, dimensions and weights for the engine, generator, enclosure, including major auxiliary equipment and to include the following listed below B thru I. | | |
| B. Engine generator set, including sales literature and elevation drawings clearly showing entrance points and interconnections. | | |
| C. Fuel consumption curves published kw ratings, combustion air (cfm) requirements. | | |
| D. Dimensions for the generator set enclosure, showing access points, and | | |

| | COMPLY | |
|--|---------------|-----------|
| | YES | NO |
| confirmation concerning fastener sizes, material sizes, hinge sizes, and door latch details shall be supplied as specified. | | |
| E. Exhaust silencer, manufacturer's name and model number including details for the flex, 90° degree exhaust elbow and rain cap. | | |
| F. Battery racks, battery size and amp hour rating. | | |
| G. Drawing showing the load take-off provisions including access points to service the machine. | | |
| H. Electrical diagrams and schematics for all equipment supplied. | | |
| I. Guards shall be provided over all exposed moving parts as required by OSHA. | | |
| TESTING: | | |
| A. The manufacturer shall be responsible for design prototype tests as described herein. | | |
| B. Components of the emergency system, such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. | | |
| <p>C. Prototype test programs shall include the requirements of NFPA-99 and NFPA-110 and the following:</p> <ul style="list-style-type: none"> • Maximum power (kw). • Maximum motor starting (kva) at 35% instantaneous voltage dip. • Alternator temperature rise by embedded thermocouple and by resistance method per NEMA MG1-32.40. • Governor speed regulation under steady-state and transient conditions. • Voltage regulation and generator transient response. • Fuel consumption at ¼, ½, ¾, and full load. • Harmonic analysis, voltage waveform deviation, and telephone influence factor. • 3-Phase short circuit test. • Alternator cooling air flow. • Torsional analysis testing to verify that the generator set is free of harmful torsional stresses. • Endurance testing. <p>After assembly and prior to painting, a certified two (2) hour 100% load test is to be performed. Record each ¼ hour kw rating, water temp, oil pressure, ambient and fuel consumption. The test is to include three (3) transient response reports at 50%, 75% and 100% load. Reports are to be type written and certified to be true and correct. The NJTA reserves the right to witness the test.</p> | | |
| GENERAL: | | |
| A. Kohler Model 100REZGD with a 4R12X generator or an approved equivalent. | | |
| I B. Provide 125kVA and 100 kw at 120/208 3phase. The generator set shall | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| be capable of this rating while operating in an ambient condition of 77° F and 500 feet above sea level. | | |
| C. The generator set shall be capable of starting motor loads of 432 kva in rush, with a maximum voltage dip of 35%. | | |
| C. D. Vibration isolators shall be provided between the engine-alternator and heavy-duty steel base. | | |
| ENGINE: | | |
| A. The 5.7 liter displacement engine shall deliver a minimum of 155 hp at a governed speed of 1,800 rpm. | | |
| B. Replaceable fuel filters and electric fuel shut-off valve. | | |
| C. Isochronous governor capable of 0.25% steady state frequency. | | |
| D. 12-volt positive engagement solenoid shift-starting motor. | | |
| E. 70-ampere minimum automatic battery charging alternator with solid-state voltage regulation. | | |
| F. Positive displacement, full pressure lubrication oil pump, replaceable cartridge oil filters, dipstick, and oil drain. | | |
| G. Dry-type replaceable air cleaner elements with restriction indicator. | | |
| H. The naturally aspirated or turbo-charged engine shall be fueled with natural gas be 8-cylinders and liquid cooled. | | |
| I. A unit-mounted radiator, blower fan, water pump, thermostat, and radiator duct flange (un-housed only) shall properly cool the engine. | | |
| J. The engine shall be equipped with block heater. | | |
| K. The engine shall be EPA certified. | | |
| ALTERNATOR: | | |
| A. The alternator shall be a Fast Response or approved equivalent permanent magnet brushless design. | | |
| B. The alternator shall be salient-pole, brushless, 4-bus bar, self-ventilated of drip-proof construction with amortisseur rotor windings and skewed stator for smooth voltage waveform. The insulation shall meet the NEMA standard (MG1-33.40) for Class H and be insulated with epoxy varnish to be fungus resistant per MIL 1-24092. Temperature rise of the rotor and stator shall be limited to 130°C. The excitation system shall be of brushless construction controlled by a solid- state voltage regulator capable of maintaining voltage within +/- .25% at any constant load from 0% to 100% of rating. The regulator must be isolated to prevent tracking when connected to SCR loads, and provide individual adjustments for voltage range, stability and volts-per-hertz operations; and be protected from the environment by conformal coating. | | |
| C. The generator set shall meet the transient performance requirements of ISO 8528-5, level G-2. | | |
| D. The alternator excitation shall be of a permanent magnet exciter design. | | |
| E. The generator shall be inherently capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current support devices. | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| F. The alternator having a single maintenance-free bearing shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel. | | |
| CONTROLLER: | | |
| A. A set mounted controller capable of facing right, left or rear shall be vibration isolated on the generator enclosure. The microprocessor control board shall be moisture proof and capable of operating from 40°C to 85°C. Relays shall only be acceptable in high current circuits. | | |
| B. Circuitry shall be plug-in design. Controller shall be equipped to accept a plug-in device capable of allowing maintenance personnel to test controller performance without operating the engine. | | |
| C. Controller shall be a Decision Marker 3000 or an approved equivalent microprocessor including a 485 communication module with remote connections. All necessary hardware and software shall be provided to allow both generator and automatic transfer switch to be monitored through existing Kohler software package currently operating at GSP Division Facilities. | | |
| D. Complete two wire start/stop control, which shall operate on closure of a remote contact. | | |
| E. Speed sensing and a second independent starter motor disengagement system shall protect against the starter engaging with a moving flywheel. Battery charging alternator voltage shall not be acceptable for this purpose. | | |
| F. The starting system shall be designed for restarting in the event of a false engine start by permitting the engine to completely stop and then re-engage the starter. | | |
| G. Cranking cyler with 15-second ON and OFF cranking periods. | | |
| H. Over crank protection designed to open the cranking circuit after 75 seconds if the engine fails to start. | | |
| I. Circuitry to shut down the engine when signal for high coolant temperature, low oil pressure, or over speed is received. | | |
| J. Eng J. Engine cool down timer, factory-set at five (5) minutes to permit unloaded running of the stand-by set after transfer of the load to normal. This system shall be inherently built into the generator control and shall not be part of the transfer switch. | | |
| K. Three position (Automatic - OFF - ON - TEST) selector switch shall be provided. In the "Test" position, the engine shall start and run regardless of the position of the remote starting contacts. In the "Automatic" position, the engine shall start when contacts in the remote control circuit close and stop five (5) minutes after those contacts open. In the "Off" position, the engine shall not start even though the remote start contacts close. This position shall also provide for immediate shutdown in case of an emergency. Reset of any fault lamp shall also be accomplished by putting the switch to the "Off" position. | | |
| INDICATING LIGHTS TO SIGNAL: | | |
| <ul style="list-style-type: none"> Not-in-Auto (flashing red) | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| <ul style="list-style-type: none"> • Over-crank (red) • Emergency stop (red) • High engine temperature/low coolant level (red) • Over speed (red) • Low oil pressure (red) • * Battery charger malfunction (red) • * Low battery voltage (red) • * Pre-alarm high engine temperature (yellow) (liquid cooled models) • * Pre-alarm low oil pressure (yellow) • * Low coolant temperature (red) (liquid cooled models) (*required to meet NFPA-99 or NFPA-110 Level 1 Regulations). | | |
| INSTRUMENT PANEL: | | |
| A. Dual range voltmeter, 3-1/2", +/- 2% accuracy. | | |
| B. Dual range ammeter, 3-1/2", +/- 2% accuracy. | | |
| C. Voltmeter-ammeter phase selector switch. | | |
| D. Lights to indicate high or low meter scale. | | |
| E. Direct reading pointer type frequency meter, 3-1/2", +/- 5% accuracy, 45 to 65 Hz scale. | | |
| F. Panel illuminated lights. | | |
| G. Battery charging meter. | | |
| H. Coolant temperature gauge. | | |
| I. Oil pressure gauge. | | |
| J. Running time meter. | | |
| K. Voltage adjust rheostat (+/- 5% range). | | |
| ACCESSORIES: | | |
| A. Over voltage protection shall shut down the unit after one second of 15% or more over voltage. | | |
| B. Battery rack, battery cables, maintenance free 12-volt battery (ies) capable of delivering the minimum cold cranking amps required at 0° F per SAE Standard J-537. | | |
| C. Gas proof, seamless, stainless steel, flexible exhaust connector (s) ending in pipe thread or SAE flange. Water resistant, roof dress collar shall be provided between the muffler and the enclosure. A plain roof hole without weather proofing shall not be acceptable. | | |
| D. Flexible fuel line (s) rated 300° F and 100 psi ending in pipe thread. | | |
| E. Engine exhaust silencer, coated to be temperature and rust resistant, rated for critical applications. Exhaust noise shall be limited to 65 dba as measured at 10 feet in a free field environment. | | |
| F. Block heater (1000 watt minimum) of proper wattage and voltage thermostatically controlled to maintain engine coolant at 90° F, 32°C to meet the start-up requirement of NFPA-99 or NFPA-110 regulations. | | |
| G. 10-ampere automatic float and equalize battery charger with +/- 1% constant voltage regulation from no load to full load over +/- 10% AC input | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| line variation, current limited during engine cranking and short circuit conditions, temperature compensated for ambient from -40°C to +60°C, 5% accurate voltmeter and ammeter, fused, reverse polarity and transient protected. Optional alarm circuit board shall be supplied to meet the requirements of NFPA-110 for low battery voltage, high battery voltage, and battery charger malfunction. | | |
| H. 16-light remote annunciator shall monitor all controller functions described in the "Controller" section plus line power and generator power monitoring. An integral lamp test and horn silence switch shall be included that meets NFPA-110. | | |
| I. Molded case circuit breaker rated 350 amps to match Automatic Transfer Switch shall be mounted on the generator. | | |
| J. Pre alarms shall be furnished to signal the following conditions: <ul style="list-style-type: none"> • Low coolant temperature • Approaching low oil pressure • Approaching high coolant temperature | | |
| K. Three-pole, double throw, 240-volt, 10-amp relay to provide signal upon engine ignition for louver control. | | |
| L. Radiator duct flange. | | |
| M. Oil drain extension kit. | | |
| N. Fast check hand held diagnostic fault detector to activate and check generator control circuits without operating the engine/generator set. | | |
| O. Enclosure shall be Kohler or an approved equivalent Level I aluminum enclosure, reducing overall sound level to approximately 72 dba at 23' with internal muffler. | | |
| Q. Oil, water and fumes disposal lines shall be extended to the exterior of the enclosure. Valves shall be provided near the engine for oil and water lines. Plugs shall be provided where applicable, on the exterior of the enclosure. | | |
| Q. A " Danger High Voltage " sign shall be provided on the enclosure. | | |
| R. The genset shall be installed on pad type vibration isolators along with all other accessories specified. | | |
| INSTALLATION: | | |
| A. The equipment shall be installed by Garden State Parkway Division personnel. The successful bidder shall provide a full set of manufacturer's plans, specifications and schematics for installation to the Authority, within three (3) days of notice of intent to award. Any additional recommendations from the manufacturer, for installation, in accordance with all applicable codes, must be supplied with the manufacturer's plans. | | |
| SITE TESTS: | | |
| A. An installation check, start-up, and building load test shall be performed by the manufacturer's local representative. The time and date of the site test shall be determined by the Garden State Parkway Division. Tests shall include the following below: | | |
| B. Fuel, lubricating oil and antifreeze shall be checked for conformity to the | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| manufacturer's recommendations under the environmental conditions present and expected. | | |
| C. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include engine heaters, battery charger, generator strip heaters, remote annunciator, etc. | | |
| D. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation. | | |
| E. Automatic start up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch times shall be adjusted for proper systems coordination. Engine temperature, oil pressure and battery charge level along with generator voltage, amperes and frequency shall be monitored throughout the test. | | |
| F. All major components (engine, generator and transfer switch) shall be manufactured in the United States. | | |
| G. Site load bank test, 100% loaded (load bank by generator supplier). | | |
| AUTOMATIC TRANSFER SWITCH: | | |
| A. The intent of this specification to describe and govern the purchase of an Automatic Transfer Switch that has been prototype-tested, factory built, production-tested, and site tested, together with all accessories necessary for a complete installation as shown on the manufacturer's plans and drawings and specified herein. The Automatic Transfer Switch shall have a 400 amp current ratings. The Automatic Transfer Switch shall consist of an inherently double-throw power transfer switch unit and a control module interconnected to provide complete automatic operation. All equipment shall be new and in current production. | | |
| B. The company selected shall assemble the standby generator set and system as a matched unit so that there is one-source responsibility for warranty, parts and service through a local representative with factory-trained personnel. Kohler Model KSS-ACTF-0400# or approved equivalent. A full set of manufacturer's plans, specifications, and schematics for installation to the Authority, within three (3) days of notice of intent to award. Any additional recommendations from the manufacturer, for installation, in accordance with all applicable codes, must be supplied with the manufacturer's plans. | | |
| MECHANICAL REQUIREMENTS (ATS): | | |
| A. The Automatic Transfer Switches shall be furnished in a NEMA 4X enclosure. | | |
| B. All moveable parts of the operating mechanism shall remain in positive mechanical contact with the main contacts during the transfer operation without the use of separate mechanical interlocks. | | |
| C. All main contacts shall be silver composition. The main contacts shall be protected by arcing contacts in sizes 400 amperes and over. The main contacts shall be the blow-on configuration and segmented construction in | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| ratings 600 amperes and over. | | |
| D. W D. Where neutral conductors must be switched as shown on the manufacturer's plans, the Automatic Transfer Switch shall be provided with fully rated, overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which transfer or retransfer is being made. The overlapping neutral transfer contacts shall not overlap for time duration greater than 100 milliseconds. A non-overlapping neutral transfer (fourth) pole shall not be acceptable. | | |
| E. When neutral conductors are to be solidly connected as shown on the manufacturer's plans, a neutral conductor terminal plate with fully rated AL-CU pressure connectors shall be provided. | | |
| F. All contacts, coils, springs, and control elements shall be conveniently removable from the front of the transfer switch without major disassembly or disconnection of power conductors. | | |
| G. The contact transfer time shall not exceed one-sixth (1/6) of a second. | | |
| ELECTRICAL REQUIREMENTS: | | |
| A. Automatic Transfer Switches not intended for continuous duty or repetitive load transfer switching shall not be acceptable. | | |
| B. The Automatic Transfer Switch shall be rated in amperes for total system transfer including control of motors, electric-discharge lamps, electric heating and tungsten-filament lamp load. Switches rated 225 amperes and below shall be suitable for 100% tungsten-filament lamp load. Switches rated above 225 amperes shall be suitable for 30% tungsten-filament load. | | |
| C. The Automatic Transfer Switch shall be rated to withstand the rms symmetrical short circuit current available at the Automatic Transfer Switch terminals with the type of over-current protection shown on the manufacturer's plans. | | |
| TRANSFER SWITCH CONTROL SYSTEM: | | |
| A. The control module shall direct the operation of the transfer switch. The module's sensing and logic shall be a built-in microprocessor-based system for maximum reliability, minimum maintenance, and inherent digital communications capability. The control settings shall be stored in non-volatile EEPROM. The module shall contain an integral programmable clock and calendar. The control module shall have a keyed, disconnect plug to enable the control module to be disconnected from the transfer mechanism for routing maintenance. | | |
| B. The control module shall be mounted separately from the transfer mechanism unit for safety and ease of maintenance. Interfacing relays shall be industrial control grade plug-in type with dust cover. | | |
| C. The control module shall include programming keypad, alphanumeric display for monitoring settings and diagnostic values, key-lockable program selector switch, light-emitting diode status indication, and user instructions. | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| These features shall be user accessible when the enclosure door is closed. | | |
| <p>D. The control module shall be capable of storing the following records in memory for access either locally (at the control module) or remotely (at a computer).</p> <ul style="list-style-type: none"> • Number of hours transfer switch is in the emergency position (total and since record reset). • Number of hours the emergency is available (total and since record reset). • Total days that control has been energized (total and since record reset). • Total transfers in either direction (total and since record reset). • Date of record reset. • Date of last exercise period. • Date, time, and description of the last four (4) source failures. • Elapsed time during the most recent source outage. | | |
| OPERATION/SOURCE VOLTAGES: | | |
| A. The voltage of each phase of the normal source and a single phase of the emergency source shall be monitored with pickup adjustable from 75% to 100% and dropout adjustable from 70% to 95% of nominal. Adjustment must be digital. | | |
| B. An automatic minimum differential of 2% shall be maintained between pickup and dropout settings. | | |
| C. Repetitive accuracy of the setting shall be 2% or better over an operating temperature range of -20° F to 150° F. | | |
| D. The settings shall be fully field-adjustable by keypad or keyboard (local or remote) in increments of 1 volt without opening the enclosure door and without the use of special tools or separate meters. | | |
| E. Factory settings shall be pickup at 90% and dropout at 85%. | | |
| F. A light emitting diode (LED) shall indicate that normal and/or emergency voltage is within the set point parameter. The indication shall be viewable when the enclosure door is closed. | | |
| OPERATION/TIME DELAYS: | | |
| A. The control module shall include four time delays that are fully field-adjustable by keypad or keyboard in increments of 1 second over the entire range. | | |
| B. Adjustments and viewing of the time delay values shall be accessible when the enclosure door is closed. | | |
| C. Light emitting diodes shall indicate when the timing feature is running and when the time delay has ended. | | |
| OPERATION/REQUIRED TIME DELAYS: | | |
| A. Time delay for engine start to delay initiation of transfer for momentary source outages: Range 0 - 6 seconds. Factory set at 5 seconds. | | |
| B. Time delay for transfer to emergency: Range 0 - 5 minutes. Factory set at 5 | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| seconds. | | |
| C. Time delay for transfer back to normal: Range 0 - 30 minutes. Factory set at 5 seconds. | | |
| D. Time delay for engine cool down: Range 0 - 30 minutes. Factory set at 5 seconds. | | |
| E. Input values outside the allowable parameters shall cause a "range error" message to be displayed. | | |
| F. The user shall have the ability to manually program an engine start and run for a period of up to 32 hours @ 100% of rated load and 40 hours @ 75% of rated load. The time delay transfer to emergency and/or normal may be by-passed during the run period. | | |
| G. A numeric indication shall be displayed of the run time remaining in hours and minutes. The run period may be stopped at any time with a single keystroke. | | |
| H. After the run period has stopped, the engine shall run unloaded for the cool down time. | | |
| I. User terminals shall be available to connect a normally closed contact that, when opened, signals the control module to start and transfer load to the engine generator. Closing these contacts shall initiate a retransfer and engine cool down sequence. The load shall be transferred to an available utility source immediately if the generator source should fail. | | |
| <p>J. The following features shall be built into the control module logic. These features shall be enabled at the factory or in the field by installing an insulated program jumper provided by the vendor as standard.</p> <ul style="list-style-type: none"> Extended Time Delay: Allows the time delay settings to be extended to 99 minutes. Plant Exerciser: Programmable seven-day, fourteen-day or calendar exerciser. Each exerciser mode shall be capable of performing up to two exercise runs in up to five exercise event periods. The exerciser period shall be programmed with the enclosure door closed. The exercise time may be reset at any time with a single keystroke. The engine shall be allowed to run when the exercise period is terminated. All phases of normal and all or single phases of emergency shall be monitored for over voltage and single phase of normal and emergency for over and under frequency. The values shall be programmed with the enclosure door closed. Anti-single phasing protection shall detect regenerative voltage as a failed source condition. In-phase monitoring shall continuously monitor the contactor transfer times, source voltage, frequency and phase angle to provide a self-adjusting, zero crossing contactor transfer signal. Manual operation override shall function to bypass any manual switch accessories if the source to which the transfer switch is positioned fails. This program jumper shall be factory installed. | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| STATUS INDICATORS: | | |
| A. Light-emitting diodes shall indicate the status of the following: | | |
| B. Contactor Position. | | |
| C. System Status: <ul style="list-style-type: none"> • Transfer Switch Position Sensing Fault • Transfer Switch Fail to Transfer • Internal Control Module Fault • Manual Transfer Operation • External Fault Condition (two inputs) • Not In Automatic • Programming Switch Not In Off | | |
| D. The system status messages shall also be shown on the alphanumeric display. | | |
| E. Accessory Active: <ul style="list-style-type: none"> • Plant Exerciser • In-Phase Monitor • Load Shed • Area Protection | | |
| F. A lamp test push button shall light all light emitting diodes. | | |
| CONTROL MODULE: | | |
| A. The control module shall have a three-position, key-operated, programming control switch. The key shall be removable in any position. The positions shall be as follows: <ul style="list-style-type: none"> • Off - Allows all enabled accessories to be monitored only. Settings cannot be changed while in this position. • Local - Allows all enabled accessory settings to be changed by local key pad entry. • Remote - Allows all enabled accessories to be altered via the remote communications port. | | |
| B. A momentary-type test switch shall be provided to simulate a normal source failure. | | |
| C. The transfer switch shall have load-shed and sequencing capability to allow up to nine selected loads to be disconnected prior to transfer in either direction. It shall be possible to vary the time sequence for re-energizing of the nine loads. | | |
| D. A set of gold-flashed contacts rated 10 amps, 28 VDC shall be provided for a low-voltage engine start signal when the normal source fails. | | |
| COMMUNICATIONS CAPABILITIES: | | |
| A. The transfer switch shall be capable of being connected in any of the following five network configurations. (See Point to Point Connectivity and Multidrop Network Sections). Interactive software developed for Automatic Transfer Switch applications must be available. The software must monitor, allow alteration of values, and provide system diagnostics. All values and | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| indications of the Automatic Transfer Switch keypad must be available through the networks. | | |
| POINT-TO-POINT CONNECTIVITY: | | |
| A. It shall be possible to connect the Automatic Transfer Switch directly to a personal computer in the following ways: <ul style="list-style-type: none"> Local Connection - Maximum cable length 50 feet using RS232. Local Connection - Maximum cable length 4,000 feet using RS422. Remote Connection - Utilizing phone lines, modems and RS232. | | |
| MULTIDROP NETWORKS: | | |
| A. Control modules shall be capable of being connected as a local area network using a shielded twisted pair. A single local area network shall be capable of addressing and interfacing with up to 128 control modules. | | |
| B. Local Connection - Total cable length of all drops up to 128 is 4,000 feet. | | |
| C. Remote Connection - Connect to a local network as referenced below then utilize phone lines to monitor and control. | | |
| D. The minimum computer requirements for local or remote area networks are an IBM PC or true compatible with 512K RAM, disk drive, VGA or monochrome monitor, and MS-DOS 3.0 or higher. | | |
| E. It shall be possible to connect a printer to the computer for hard copy generation. | | |
| F. The communication cable shall run in separate conduit. | | |
| COMPLIANCE WITH CODES AND STANDARDS: | | |
| A. The Automatic Transfer Switch shall conform to the requirements of: <ul style="list-style-type: none"> UL 1008 Standard for Automatic Transfer Switches. NFPA 70 National Electrical Code, including use in emergency and standby systems in accordance with Articles 517,700. NFPA 99 Essential Electrical Systems for Health Care Facilities. NFPA 110 Standard for Emergency and Standby Power Systems. IEEE Standard 446 Recommended Practice for Emergency and Standby Power Systems (Orange Book). IEEE Standard 241 Recommended Practice for Electric Power Systems in Commercial Buildings (Gray Book). NEMA Standard ICS 2-447 Automatic Transfer Switches. | | |
| WITHSTAND RATINGS: | | |
| A. The Automatic Transfer Switch shall be rated to withstand the available rms symmetrical short-circuit current at the Automatic Transfer Switch terminals with the type of over current protection shown on the manufacturer's plans. | | |
| B. The control panel shall meet or exceed the voltage surge withstand capability in accordance with IEEE Standard 472-1974 (ANSI C37.90a-1974) and the impulse withstand voltage test in accordance with the proposed NEMA Standard ICS 1-109. The control panel shall conform to the test requirements of UL 991 for transient over voltage, electromagnetic | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| susceptibility, and electrostatic discharge. | | |
| TEST AND CERTIFICATION: | | |
| <p>A. All production units shall be subjected to the following factory tests:</p> <ul style="list-style-type: none"> The complete Automatic Transfer Switch shall be tested to ensure proper operation of the individual components and correct overall sequence of operation and to ensure that the operating transfer time, voltage, frequency and time delay settings are in compliance with the specification requirements. The switch shall be subjected to a dielectric strength test per NEMA Standard ICS 1-109.21. | | |
| MANUFACTURER'S RESPONSIBILITY: | | |
| A. The supplier shall be able to provide the services of a field technician to test and demonstrate and train the operating personnel. | | |
| B. The Authority shall have the option of witnessing the demonstration of the system. Notification shall be provided one week prior to the test and demonstration. Submittal shall include specification sheets showing all standard and optional accessories to be supplied: schematic, wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set and the transfer switch. | | |
| C. Each transfer switch shall be provided with an operator's manual providing installation and operating instructions. | | |
| D. Each automatic transfer switch and generator set shall be warranted by the generator set manufacturer for one year from the date placed in service. | | |
| PRODUCT: | | |
| <p>A. Automatic micro-processor transfer switches,</p> <p>B. or approved equivalent which shall include the following additional accessories:</p> | | |
| <p>B. A dry contact kit shall be provided for remote indication. The contacts shall be SPDT and rated for 10 amperes at 125 VAC. The contacts shall indicate the following:</p> <ul style="list-style-type: none"> Contactor in the normal position. Contactor in the emergency position. Normal source available (as required in the "Source Voltages" section). Emergency source available (as required in "Source Voltages" section). Transfer switch not in automatic operation. Program selector switch not in the off position. System alert (as required in the "System Status" section). Load bank control. | | |
| C. An exerciser shall be provided to offer a selectable loaded/unloaded operation as required in "Plant Exerciser". The selector switch shall be mounted on the inside of the enclosure. The exerciser shall store and execute | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| up to ten generator set start/run cycles. It shall be possible to disable and enable any of these cycles without changing the day and time settings. A digital countdown for the amount of time remaining on the exercise cycle shall be also provided. | | |
| D. An in-phase monitor shall be provided as specified in the "In-Phase Monitoring" section. | | |
| E. Anti-single phasing protection shall be provided on three phase systems. Single phasing shall be detected, even though a possible resultant regenerated voltage is within the parameters of the source sensing. A single phasing source shall be considered failed and the logic shall initiate a transfer to the alternate source when it is available. | | |
| F. A RS-485 port adapter board shall be provided for interconnecting the transfer switch local area network or single unit operation up to a distance of 4,000 feet. | | |
| G. Software shall be provided to allow computer accessing and displaying transfer switch data. The software shall be capable of being used on any DOS based 100% IBM compatible computer. | | |
| H. An RS-232/RS-485 adapter shall be provided to interface between a local area network and single unit operation, up to a distance of 4,000 feet, and a 100% IBM compatible computer or a modem. This adapter shall include the cable and/or the adapter to properly connect to the computer. | | |
| I. A modem shall be provided to allow a 100% IBM compatible computer to communicate with the transfer switch over telephone lines. This modem shall be located at the computer. | | |
| J. A modem shall be provided to allow the transfer switch to communicate with a 100% IBM compatible computer over telephone lines. This modem shall be located at the transfer switch site. | | |
| K. A RS-232/RS-485 adapter shall be provided to interface between a local area network or single unit operation up to a distance of 4,000 feet, and a modem. | | |
| L. A ten (10) contact kit shall be provided for connection to dialer. | | |
| PAINT: | | |
| A. All steel parts shall have the mill scale and oil removed by means of a high-pressure chemical cleaner prior to painting. These surfaces shall be primed with a zinc rich, rust preventive primer. The finish paint shall be a high quality, high solid, polyurethane type enamel. All painting shall be done in conjunction with good commercial practices. | | |
| B. Enclosure Color: Manufacturer's Standard. | | |
| C. Generator and Transfer Switch: Manufacturer's Standard. | | |
| MANUALS/ELECTRICAL DIAGRAM: | | |
| A. One (1) service manual, one (1) parts manual, and one (1) electrical diagram for each unit shall be supplied at time of delivery. | | |
| NOTE: GENERATOR AND TRANSFER SWITCH MUST BE DELIVERED AT THE SAME TIME. NO EXCEPTIONS | | |

[illegible]

Date _____

NEW JERSEY TURNPIKE AUTHORITY

GENERAL INSTRUCTIONS AND SPECIFICATIONS FOR:

STAND-BY 100 KW DIESEL-POWERED GENERATOR AND ACCESSORIES

| Quantity | Description | Maximum Delivery Date |
|----------|--|---------------------------------|
| 1 | Stand-by 100 KW Diesel-Powered Generator and Accessories | 120 Days After Receipt of Order |

SPECIFICATIONS: SBDPG-2016 STAND-BY 100 KW DIESEL-POWERED GENERATOR AND ACCESSORIES

COMPLIANCE WITH RULES AND REGULATIONS: The units must meet all current OSHA, ANSI, PEOSHA, NFPA 99, NFPA 110, National Electrical Code, and all other applicable regulations. The New Jersey Turnpike Authority reserves the right to request certification indicating the unit bid has been certified and tested to meet these requirements with proper documents attesting to said Certification.

ENERGY STAR REQUIREMENTS: If applicable for items specified in the bid package, the vendor must provide products that earn Energy Star Certification and meet the Energy Star specifications for energy efficiency. The vendor is encouraged to visit energystar.gov for complete product specifications and updated lists of qualifying products. The Energy Star label must also be affixed to each delivered item. The bidder's signature on the signature page certifies that items so indicated that have earned Energy Star and meet the Energy Star specifications or other standards for energy efficiency will be supplied.

ERRORS AND OMISSIONS: Inadvertent omissions or errors in the attached specifications must be brought to the attention of the New Jersey Turnpike Authority's Director of Procurement and Materials Management at 732-750-5300 before bid submission date. If, with knowledge of such error or omission and prior to the correction thereof, the bidder proceeds with any work affected hereby, they shall do so at their own risk and the work so done shall not be considered as work done under and in performance of this Agreement unless and until approved and accepted.

DELIVERY INSTRUCTIONS:

E. Vendor must contact Peter Perperas (Project Supervisor) at 732-442-8600 ext. 2868 for authorization to schedule date and time prior to delivery. **Deliveries shall be made to the NJTA Garden State Parkway Division's District 5 Telegraph Hill Central Maintenance Facility located at GSP Exit 116 in Holmdel, NJ 07733.**

F. Vendor shall be responsible for all delivery, shipping and pick-up expenses.

G. All units must be pre-delivery serviced, completely assembled, operational, and cleaned prior to delivery.

H. The following administrative package **must** accompany all deliveries:

- **Invoice**: purchase order number must be displayed on vendors invoice. Invoice shall have current date and be hand delivered to Peter Perperas (400 King George Rd Woodbridge, NJ 07095) after final acceptance of complete order.
- Warranty forms properly executed.
- Four (4) keys for each unit shall be furnished. **NO EXCEPTIONS**
- **Generator and Transfer Switch must be delivered at the same time. NO EXCEPTIONS**

WARRANTY: All units delivered must be guaranteed to be free from defects in materials, design and workmanship for a minimum of one (1) year with an additional warranty of four (4) years parts and labor from the time of acceptance by the New Jersey Turnpike Authority. All warranties shall start upon written acceptance of units by the New Jersey Turnpike Authority. Warranty must include service availability from any manufacturers authorized dealer establishment most closely located to Parkway and Turnpike area. This repair facility may not be further than 100 miles from the Central Maintenance Facility in Holmdel, NJ 07733 or the Central Shops Maintenance Facility located in Hightstown, NJ 08520. If warranty service is required, the vendor who supplied the unit shall provide for pickup, delivery and repair of unit at no charge to the New Jersey Turnpike Authority. The vendor shall also have a program to include an in-house warranty. All warranty periods shall start from date of acceptance of unit by the New Jersey Turnpike Authority.

EXCEPTION SHEET: Exception sheet is furnished with each set of specifications. Bidders making exceptions must note exceptions by item and indicate substitution in lieu and submit with bid, detailed specifications on the substitution. If the vendor is submitting an alternate product, component, feature or part to what is referenced in the specifications, the proposals **must** be accompanied by descriptive literature, marked and indicate the exact items to be furnished, with an engineering drawing of the same. **Failure to supply information requested may result in rejection of bid.** Where no exception is taken, the word "None" shall be neatly printed or typed on the exception sheet. **Failure to supply information and/or failure to complete the bidder's exception spaces in the prescribed manner may disqualify bid. It shall be understood that if no exception is taken, the vendor shall supply all material exactly as specified. No substitution will be permitted after receipt of bids.**

MANUFACTURER'S PRODUCTION SHEET: The vendor shall furnish one (1) copy of the actual Factory Production Sheet for each unit provided. The copies of the Factory Production Sheet shall be submitted at the time of the Authority's inspection of the unit.

TRAINING: It shall be the responsibility of the successful bidder to supply all safety, operational and service training to New Jersey Turnpike Authority personnel in accordance with all applicable ANSI and OSHA regulations. The safety and operational training shall consist of a complete review and understanding of the manufacturer's owner manual, along with actual operation of equipment. The instructor shall emphasize all proper uses for safe operation. The training shall include but not limited to all general troubleshooting of the hydraulic system and associated electronics. The instructor shall also emphasize the proper use of tools and test equipment along with general shop safety. The service seminars shall be similar to factory and manufacture type schools. The training shall be scheduled and take place at one (1) site designated by the New Jersey Turnpike Authority.

LABELS: Plastic stick-on labels shall not be acceptable.

ADVERTISEMENTS: No Dealer advertisements shall appear on unit or any other related equipment.

ACCESSORIES: All accessories shall be manufacturer installed when the item is available from the manufacturer.

FACILITIES: Bidders shall represent a manufacturer, which has in operation a factory adequate for the manufacture of the equipment, which it proposes to furnish. The manufacture(s) whose associated equipment or products are bid shall have a full service warranty and parts supply facility that can guarantee availability of parts within 24 hours after telephone order and shall be located within a 100 mile radius of either Central Shops Maintenance Facility (exit 8 on the NJ Turnpike) located in Hightstown, NJ 08520 or Telegraph Hill Maintenance Facility (exit 116 on the GSP) located in Holmdel, NJ 07733. This facility will be required to establish an in-house warranty program and provide all warranty work related to the equipment in the bid proposal. The bidder shall submit the locations, names and telephone numbers of people who are authorized to service the equipment or who can be reached for emergency service.

Location_____

Phone #_____

Contact_____

Name & Title

**SPECIFICATIONS: SBDPG-2016
STAND-BY 100 KW DIESEL-POWERED GENERATOR
AND ACCESSORIES**

INTENT: It is the intent of this specification to describe and govern the purchase of one (1) Stand-By 100 KW Diesel-Powered Generator and Accessories. The components including the completed unit shall be new and of the latest design and be in current production at the time of the submission of bid. No bid shall be considered unless the vendor submitting the bid can meet the following conditions. All standard and optional equipment shall be Original Equipment Manufacturer (OEM) items, when available. **NO EXCEPTIONS**

BIDDER'S INSTRUCTIONS

IT SHALL BE THE BIDDER'S RESPONSIBILITY TO CAREFULLY EXAMINE EACH ITEM OF THE SPECIFICATION. BIDDERS MUST INDICATE WHETHER THEY COMPLY OR NON-COMPLY FOR EACH LINE ITEM IN THE SPECIFICATION. FAILURE TO PROVIDE A COMPLETED BID MAY CAUSE REJECTION OF BID. ALL NON-COMPLY RESPONSES AND/OR BIDDERS PROPOSED "APPROVED EQUIVALENTS" MUST BE FULLY EXPLAINED ON EXCEPTION FORM, NOTING SECTION AND ITEM. FAILURE TO EXPLAIN NON-COMPLY RESPONSES OR FAILURE TO SUPPLY DETAILED LITERATURE/BROCHURES ON THE BIDDERS PROPOSED "APPROVED EQUIVALENTS" MAY CAUSE REJECTION OF BID. WHERE "MINIMUM/MAXIMUM" IS SPECIFIED, BIDDERS MUST PROPOSE AT LEAST THE MINIMUM/MAXIMUM SIZES OR THE BID MAY BE REJECTED.

| | COMPLY | |
|--|---------------|-----------|
| | YES | NO |
| SUBMITTALS: | | |
| A. The contractor shall furnish data showing manufacturer's model numbers, dimensions and weights for the engine, generator, enclosure, including major auxiliary equipment, to include the following listed below B thru I. | | |
| B. Engine generator set, including sales literature and elevation drawings clearly showing entrance points and interconnections. | | |
| C. Fuel consumption curves published kw ratings, combustion air (cfm) requirements. | | |
| D. Dimensions for the generator set enclosure, showing access points, and confirmation concerning fastener sizes, material sizes, hinge sizes, and door latch details shall be supplied as specified. | | |
| E. Exhaust silencer, manufacturer's name and model number including details for the flex, 90° degree exhaust elbow and rain cap. | | |
| F. Battery racks, battery size, and amp hour rating. | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| G. Drawing showing the load take-off provisions including access points to service the machine. | | |
| H. Electrical diagrams and schematics for all equipment supplied. | | |
| I. Guards shall be provided over all exposed moving parts as required by OSHA. | | |
| TESTING: | | |
| A. The manufacturer shall be responsible for design prototype tests as described herein. | | |
| B. Components of the emergency system, such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. | | |
| C. Prototype test programs shall include the requirements of NFPA-99 and NFPA-110 and the following: <ul style="list-style-type: none"> • Maximum power (kw). • Maximum motor starting (kva) at 35% instantaneous voltage dip. • Alternator temperature rise by embedded thermocouple and by resistance method per NEMA MG1-32.40. • Governor speed regulation under steady-state and transient conditions. • Voltage regulation and generator transient response. • Fuel consumption at 1/4, 1/2, 3/4, and full load. • Harmonic analysis, voltage waveform deviation, and telephone influence factor. • 3-Phase short circuit test. • Alternator cooling air flow. • Torsional analysis testing to verify that the generator set is free of harmful torsional stresses. • Endurance testing. • After assembly and prior to painting, a certified two (2) hour 100% load test is to be performed. Record each 1/4 hour kw rating, water temp, oil pressure, ambient and fuel consumption. The test is to include three (3) transient response reports at 50%, 75% and 100% load. Reports are to be type written and certified to be true and correct. The NJTA reserves the right to witness the test. | | |
| GENERAL: | | |
| A. Kohler Model 100REOZJF with a 4T12X generator or approved equivalents. | | |
| I B. Provide 100 kw at 120/240, 1-phase. The generator set shall be capable of this rating while operating in an ambient condition of 77°F and 500' above sea level. | | |
| C. It shall provide 100kW/100 kVA when operating at 120/240 volts, 60Hz, .8 power factor. | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| ENGINE: | | |
| A. The minimum 4.5 liter cubic inch displacement engine shall deliver a minimum of at least 155 hp at a governed speed of 1,800 rpm. | | |
| B. Replaceable fuel filters and electric fuel shut-off valve. | | |
| C. Isochronous governor capable of 0.25% steady state frequency. | | |
| D. 12-volt positive engagement solenoid shift-starting motor. | | |
| E. 65-amp automatic battery charging alternator with solid-state voltage regulation. | | |
| F. Positive displacement, full pressure lubrication oil pump, replaceable cartridge oil filters, dipstick, and oil drain. | | |
| G. Dry-type replaceable air cleaner elements. | | |
| H. Turbo-charged engine shall be fueled with diesel, 4-cylinders and liquid cooled. | | |
| I. Engine shall be EPA certified. | | |
| J. Generator must accept rated load in one-step. | | |
| ALTERNATOR: | | |
| A. The alternator shall be salient-pole, brushless, $\frac{2}{3}$ pitch with 4 bus bar for external connections, self-ventilated of drip-proof construction with amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) for temperature rise limits. Temperature rise of the rotor and stator shall be limited to 130°C. The excitation system shall be of brushless construction controlled by a solid-state voltage regulator capable of maintaining voltage within +/- .20% at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full load. The TIF factor shall not exceed 50. | | |
| B. The generator shall be inherently capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current support devices. | | |
| C. The alternator having a single maintenance-free bearing designed for 40000 hour B10 life. Shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel. | | |
| CONTROLLER: | | |
| A. Decision Marker 3000 or approved equivalent Generator Set Controller. | | |
| B. The generator set controller shall be a microprocessor based control system that shall provide automatic starting, system monitoring and protection. The controller shall also provide local monitoring and remote monitoring. The control system shall be capable of PC based updating of all necessary parameters, firmware, and software. | | |
| C. The controller shall be mounted on the generator set and shall have integral vibration isolation. The controller shall be prototype and reliability tested to | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| ensure operation in the conditions encountered. | | |
| CONTROLLER BUTTONS, DISPLAY & COMPONENTS: | | |
| <p>A. The generator set controller shall include the following features and functions:</p> <p>Push button master control buttons. The buttons shall have an indicator light to initiate the following functions:</p> <ul style="list-style-type: none"> • Run Mode—when in run mode the generator set shall start as directed by the operator. • Off/Reset Mode—when in the off/reset mode the generator set shall stop, the reset shall reset all faults allowing for the restarting of the generator set after a shutdown. • Auto Mode—when in auto mode the generator set shall be ready to accept a signal from a remote device. | | |
| B. Emergency Stop Switch: the remote stop switch shall be red in color with a “mushroom” type head. Depressing the button shall immediately stop the generator set and lockout the generator set for any automatic remote starting. | | |
| C. Push Button/Rotary Selector Dial: this dial shall be used for selection of all menus and sub-menus. Rotating the dial shall move you through the menus, pushing the dial selects the menu and functions/features in that menu. Pushing the button selects the feature/function and sub-menus. | | |
| D. Digital Display: the digital display shall be alphanumeric with 2 lines of data and approximately 24 characters. The display shall have back-lighting. The display shall display status of all faults, warnings and engine faults. While the generator set is running the display shall scroll all important information across the screen. The scroll can be stopped by pushing the rotary dial. The display shall go to sleep when the generator set is not running and will wake-up when the generator set starts or the rotary dial is depressed. | | |
| E. Fault Light: the controller shall have an annunciator fault light that glows red for faults and yellow for warnings. These faults and warnings shall be displayed in the digital display. The fault light shall also glow yellow when not in auto. | | |
| F. Alarm Horn: the controller shall provide an alarm horn that sounds when any faults or warnings are present. The horn shall also sound when the controller is not in the auto mode. | | |
| G. Alarm Silence/Lamp Test Button: when this button is depressed it shall test all controller lamps. This button shall silence the alarm horn when the unit is not in auto. | | |
| H. USB Connection: the controller shall have a USB connection on the face of the controller. This connection shall allow for updating of all software and firmware. This port shall also allow for all servicing of generator set parameters, fault diagnostics and viewing of all controller information by use of a laptop computer. | | |
| I. Dedicated User Inputs: the controller shall have dedicated inputs for remote | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| emergency stop switch, remote 2-wire star for transfer switch and auxiliary shutdown. | | |
| J. The controller shall have auto resettable circuit protection integral on the circuit board. | | |
| SYSTEM CONTROLLER MONITORING & STATUS FEATURES & FUNCTIONS: | | |
| A. The generator controller shall display and monitor the following engine and alternator functions and allow adjustments of certain parameters at the controller: | | |
| B. Over Menu: <ul style="list-style-type: none"> • Active shutdowns and warnings shall be displayed if present and without the need of operator interface. • Engine runtime with total hours. • Average line to line voltage. • Coolant temperature. • Fuel level or pressure. • Oil pressure. • Battery voltage. • Software version. • Frequency. • Average current. | | |
| C. Engine Metering Menu: <ul style="list-style-type: none"> • Engine speed. • Oil pressure. • Coolant temperature. • Battery voltage. | | |
| D. Generator Metering Menu: <ul style="list-style-type: none"> • Total power in VA. • Total power in W. • Rated power % used. • Voltage L-L and L-N for all phases. • Current L1, L2, L3. • Frequency. | | |
| E. Generator Set Information: <ul style="list-style-type: none"> • Generator set model number. • Generator set serial number. • Controller set number. | | |
| F. Generator Set Run Time: <ul style="list-style-type: none"> • Engine run time total hours. • Engine loaded total hours. • Number of engine starts. • Total energy in kW. | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| G. Generator Set System: <ul style="list-style-type: none"> • System voltage. • System frequency 50/60Hz. • System phase, single/three phase. • Power rating kW. • Amperage rating. • Power type standby/prime. • Measurement units, metric/English units adjustable. • Alarm silence, always or auto only. | | |
| H. Generator Set Calibration, the following shall be adjustable at the controller: <ul style="list-style-type: none"> • Voltage L-L and L-N all phases. • Current L1, L2, L3. • Reset all calibrations. | | |
| I. Voltage Regulation, +/-0.5% regulation, the following shall be adjustable at the controller: <ul style="list-style-type: none"> • Voltage adjustable +/-10%. | | |
| J. Digital & Analog Inputs & Outputs: <ul style="list-style-type: none"> • Displays settings and status. | | |
| K. Event Log: <ul style="list-style-type: none"> • Store event history up to 1,000 events. | | |
| CONTROLLER ENGINE CONTROL FEATURES & FUNCTIONS: | | |
| A. Automatic restart—the controller shall have an automatic restart feature which shall initiate the start routine and re-crank after a failed start attempt. | | |
| B. Cyclic cranking—the controller shall have programmable cyclic cranking. | | |
| C. Engine starting aid—the controller shall have the capability of providing control for an optional engine starting aid. | | |
| D. The control system shall include time delays for engine start and cool down. | | |
| E. The control system shall interface with the engine ECM and display engine fault codes and warnings. The ECM shall also include sender failure monitoring to help distinguish between failed senders and actual failure conditions. | | |
| F. The controller shall monitor and display engine governor functions include steady state and transient frequency monitoring. | | |
| CONTROLLER ALTERNATOR CONTROL FEATURES & FUNCTIONS: | | |
| A. Integrated hybrid voltage regulator—the system shall have integral microprocessor based voltage regulator system that shall provide +/- 5% voltage regulation, no load to full load with three phase sensing. The system shall be prototype tested and control variation of voltage to frequency. The voltage regulator shall be adjustable at the controller with maximum +/- 10% adjustable of nominal voltage. | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| B. AC output voltage regulator adjustment—the system shall allow for adjustment of the integral voltage regulator with maximum of +/- 10% adjustment of the system voltage. | | |
| C. Alternator thermal overload protection—the system shall have integral alternator overload and short circuit protection matched to each alternator for the particular voltage and phase configuration. | | |
| D. Power metering—the controller digitally shall display power metering of kW and kVA. | | |
| E. Event logging—the controller shall keep a record of up to 1,000 events for warning and shutdown faults. This fault information shall be a stored record of systems events and can be reset. | | |
| F. Historical data logging—the controller total number of generator set successful start shall be recorded and displayed. | | |
| G. Programmable access—the control system shall include a USB port that gives service tech the ability to provide software and firmware upgrades. The system shall also be capable of allowing setting of all critical parameters using the service software and a laptop computer. All parameters and setting should be capable of being stored on a laptop for future upgrades of printing for analysis. | | |
| GENERATOR SET WARNING, SHUTDOWN ALARM & STATUS: | | |
| A. The generator set shall have alarms and status indication lamps that show non-automatic status and warning and shutdown conditions. The controller shall indicate with a warning lamp and or alarm and on the digital display screen any shutdown, warning or engine fault condition that exists in the generator set system. | | |
| B. Engine Functions: <ul style="list-style-type: none"> • High fuel level (alarm). • ECM communication loss (shutdown). • ECM diagnostics (alarm & shutdown). • Engine over-speed (shutdown). • Engine start aid active. • Engine under-speed (shutdown). • Fuel tank leak (alarm & shutdown). • High DC battery voltage (alarm). • High coolant temperature (alarm & shutdown). • Low DC battery voltage (alarm). • Low coolant level (shutdown). • Low coolant temperature (alarm). • Low cranking voltage (alarm). • Low engine oil level (alarm & shutdown). • Low fuel level (alarm & shutdown). • Low fuel pressure (alarm). • Low oil pressure (alarm & shutdown). | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| <ul style="list-style-type: none"> • No coolant temperature signal (shutdown). • No oil pressure signal (shutdown). • Over-crank (shutdown). • Speed sensor fault (alarm). | | |
| <p>C. Generator Functions:</p> <ul style="list-style-type: none"> • AC sensing loss over & under current (alarm & shutdown). • Alternator protection (shutdown). • Ground fault input (alarm). • kW overload (shutdown). • Locked rotor (shutdown). • Over-frequency (shutdown). • Over AC voltage (shutdown). • Under-frequency (shutdown). • Under AC voltage (shutdown). • Emergency stop (shutdown). | | |
| <p>D. General Functions:</p> <ul style="list-style-type: none"> • Battery charger fault (alarm). • Common fault (shutdown). • Common warning (alarm). • Master switch not in auto (alarm). • Generator running. • Input/output fault (alarm). | | |
| E. The generator set controller shall also be capable of meeting all necessary NFPA 110 level1 requirements, which shall include several of the above along with; EPS supplying load, Master switch “not in auto” and contacts for local and remote common alarm. | | |
| ACCESSORIES: | | |
| A. Air restriction indicator shall indicate the need for maintenance of the air cleaners. | | |
| B. Standard air cleaner shall provide engine air filtration which meets the engines manufacturer’s specifications. | | |
| <p>C. Battery:</p> <ul style="list-style-type: none"> • Each genset shall require a maintenance free BCI group 24 battery, which must meet the engine manufacturer’s specifications. • Minimum of 650 cold cranking amps. • Battery rack and battery cables capable of holding the manufacturer’s recommended batteries shall be supplied. | | |
| D. Flexible exhaust piping shall be gas proof, seamless, stainless steel. | | |
| E. The engine exhaust silencer shall be temperature and rust resistant and rated for critical applications. Silencer shall reduce total engine exhaust noise by 25-35 dba. | | |
| F. Block heater of proper wattage and voltage thermostatically controlled to maintain engine coolant temperature to meet the start-up requirement of | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| NFPA-99 or NFPA-110 regulations, Level 1. | | |
| G. Rodent guards shall be supplied preventing intrusion and protect internal components. | | |
| H. Generator heater shall be supplied and prevent the accumulation of moisture and dampness in the generator windings. The heater shall be wired on at all times. | | |
| I. Run Relay: the run relay shall provide a three-pole, double throw relay with 10-amps/250 VAC contacts to indicate that the generator is running. The relay shall provide three (3) sets of dry contacts for energizing or de-energizing devices while the generator is running e.g. indicator lamps, louvers, etc. | | |
| DOUBLE WALL SECONDARY CONTAINMENT SUB BASE FUEL TANK: | | |
| A. A sub base fuel tank used in conjunction with a diesel powered generator shall contain at least 200 gallons of diesel fuel. | | |
| B. The sub base fuel system shall be listed under UL 142, subsection entitled Special Purpose Tanks EFVT category and will bear their mark of UL Approval according to the their particular classification. | | |
| C. The above ground steel secondary containment rectangular tank for use as a sub base for diesel generators is manufactured and intended to be installed in accordance with the Flammable and Combustible Liquids Code—NFPA 30. The Standard for Installation and Use of Stationary Combustible Engine and Gas Turbines—NFPA 37, and Emergency and Standby Power Systems—NFPA 110. | | |
| D. Primary Tank: <ul style="list-style-type: none"> Rectangular in shape and constructed in clam shell fashion to ensure maximum structural integrity and allow the use of a full throat fillet weld. | | |
| E. Steel Channel Support System: <ul style="list-style-type: none"> Reinforced steel box channel for generator support with a load rating of 5,000 lbs. per generator mounting hole location. Full height gussets at either end of channel and at generator mounting holes shall be utilized. | | |
| F. Exterior Finish: <ul style="list-style-type: none"> The exterior coating shall be tested to withstand continuous salt spray testing at 100% exposure to 244 hours to a 5% salt solution at 92-97° F. The coating shall be subjected to full exposure humidity testing to 100% humidity at 100° F for 24 hours. | | |
| G. Venting: <ul style="list-style-type: none"> Normal venting shall be sized in accordance with the American Petroleum Institute Standard # 2000, Venting Atmospheric and Low Pressure Storage Tanks not less than 1¼" nominal inside diameter. | | |
| H. Emergency Venting: <ul style="list-style-type: none"> The emergency vent opening shall be sized to accommodate the total capacity of both normal and emergency venting and shall be not less | | |

| | COMPLY | |
|---|---------------|-----------|
| | YES | NO |
| than that derived from NFPA 30, table 2-8 and based on the wetted surface area of the tank. The wetted area of the tank shall be calculated on the basis of 100% of the primary tank. The vent shall be spring-pressure operated: opening pressure is 0.5/psig and full opening pressure is 2.5 psig. The emergency relief vent shall be sized to accommodate the total venting capacity of both normal and emergency vents. | | |
| I. Fuel Fill: <ul style="list-style-type: none"> There shall be a 2" NPT opening within the primary tank and lockable manual fill cap. | | |
| J. Fuel Level: <ul style="list-style-type: none"> A direct reading, UL listed magnetic fuel level gauge with a hermetically sealed vacuum tested dial shall be provided to eliminate fogging. | | |
| K. Low Fuel Level Switch: <ul style="list-style-type: none"> Shall consist of a 30-watt float switch for remote or local annunciation of a 50% standard low fuel level condition. | | |
| WEATHER ENCLOSURE: | | |
| A. Level I sound attenuated enclosure. | | |
| B. The enclosure shall be finish coated with powder baked paint. Enclosures shall be finished with the manufacturer's standard color. | | |
| C. The generator set shall be supplied with a sound attenuated enclosure providing a sound pressure of 69 dba while generator is operating at 100% load. | | |
| D. The enclosures shall allow the generator set to operate at full load in an ambient temperature of 50° C with no additional derating of the electrical output. | | |
| E. Enclosures shall be equipped with sufficient side and end doors to allow access for operation, inspection, and service of the unit. Minimum requirements are two (2) doors per side. When the generator set controller faces the rear of the generator set, an additional rear facing door shall be required. Access to the controller and main line circuit breaker shall meet the requirements of the National Electric Code. | | |
| F. Doors shall be equipped with lockable latches. Locks shall be keyed alike. | | |
| G. A duct between the radiator and air outlet shall be provided to prevent re-circulation of hot air. | | |
| H. The complete exhaust system shall be internal to the enclosure or optional with external mounted silencer insulated with a tailpipe and rain cap. | | |
| INSTALLATION: | | |
| A. The equipment shall be installed by Garden State Parkway Division personnel. The successful bidder shall provide a full set of manufacturer's plans, specifications and schematics for installation to the Authority, within three (3) days of notice of intent to award. Any additional recommendations from the manufacturer for installation in accordance with all applicable codes | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| must be supplied with the manufacturer's plans. | | |
| SITE TESTS: | | |
| A. An installation check, start-up, and building load test shall be performed by the manufacturer's local representative. The time and date of the site test shall be determined by the Garden State Parkway Division. Tests shall include the following below: | | |
| B. Fuel, lubricating oil and antifreeze shall be checked for conformity to the manufacturer's recommendations under the environmental conditions present and expected. | | |
| C. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include engine heaters, battery charger, generator strip heaters, remote annunciator, etc. | | |
| D. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation. | | |
| E. Automatic start up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch times shall be adjusted for proper systems coordination. Engine temperature, oil pressure and battery charge level along with generator voltage, amperes and frequency shall be monitored throughout the test. | | |
| F. All major components (engine, generator and transfer switch) shall be manufactured in the United States. | | |
| AUTOMATIC TRANSFER SWITCH: | | |
| A. Transfer switch system with 2-pole/3-wire solid neutral 400-amps, 240 volt-60Hz. Transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. | | |
| B. Automatic transfer switch shall be a Kohler Standard Specific Breaker—Standard Transition (KSS)/KSS-AFNF-0400# or approved equivalent. | | |
| MECHANICALLY HELD TRANSFER SWITCH: | | |
| A. The transfer switch shall be electrically operated and mechanically held with double throw construction and operated by a momentarily energized solenoid driven mechanism. Main operators shall include overcurrent disconnect devices. | | |
| B. All transfer switch sizes shall use only one (1) type of main operator for ease of maintenance and commonality of parts. | | |
| C. The switch shall be positively locked and unaffected by momentarily outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life. | | |
| D. All main contacts shall be silver composition. Switches rated 600-amperes and above shall have segmented blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts. | | |
| E. Inspection of all contacts shall be possible from the front of the switch | | |

| | | | COMPLY | |
|--|--------------|--------------|---------------|-----------|
| | | | YES | NO |
| without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800-amperes and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars. | | | | |
| F. Designs utilizing components of molded case circuit breakers, contactors, or parts, which are not intended for continuous duty, repetitive switching or transfer between two active power sources shall not be acceptable. | | | | |
| G. For two and three pole switches where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided. | | | | |
| H. For four pole switches with a switching neutral, where neutral connectors must be switched as shown on the plans, the contactor shall be provided with fully rated switched neutral transfer contacts. Overlapping neutral contacts may be used as an alternative. | | | | |
| ENCLOSURE: | | | | |
| A. The automatic transfer switch (ATS) shall be furnished in a NEMA 4X enclosure. | | | | |
| B. All standard door mounted switches and indicating LED's shall be integrated into a flush-mounted interface membrane or equivalent in the enclosure door for easy viewing and replacement. The panel shall be capable of having a manual locking feature to allow the user to lockout all membrane mounted control switches to prevent tampering. This cover shall be mounted with hinges and have a latch that may be padlocked. The membrane panel shall be suitable for mounting by others when furnished on open type units. | | | | |
| CONTROLLER DISPLAY & KEYBOARD: | | | | |
| A. A four line, 20 character LCD display and dynamic 4 button keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and control through the communications interface port or USB. | | | | |
| B. The following parameters shall only be adjustable by use of a password protected programming on the controller: <ul style="list-style-type: none"> • Nominal line voltage and frequency. • Single or three phase sensing. • Operating parameter protection. • Transfer operating mode configuration (Standard transition, Programmed transition or closed transition). | | | | |
| VOLTAGE FREQUENCY & SENSING: | | | | |
| A. Voltage (all phases) and frequency on both the normal and emergency sources shall be continuously monitored. Voltage on both normal and emergency sources and frequency on the emergency sources shall be adjustable with the following pickup, dropout, trip setting capabilities (values shown as % of nominal unless otherwise specified: | | | | |
| Parameter | Dropout/Trip | Pickup/Reset | | |

| | | | COMPLY | |
|--|------------|--------------------|---------------|-----------|
| | | | YES | NO |
| Under voltage | 75 to 98% | 85 to 100% | | |
| Over voltage | 06 to 135% | 95 to 100% of trip | | |
| Under frequency | 95 to 99% | 80 to 95% | | |
| Over frequency | 01 to 115% | 105 to 120% | | |
| Voltage unbalanced | 5 to 20% | 3 to 18% | | |
| B. Repetitive accuracy of all settings shall be within +/- 0.5% over an operating temperature range of -20° C to 70° C. | | | | |
| C. An adjustable dropout time for transient voltage and frequency excursions shall be provided. The time delays shall be 0.1 to 9.9 seconds for voltage and .1 to 15 seconds for frequency. | | | | |
| D. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keyboard, remotely via the communications interface port or USB. | | | | |
| E. The controller shall be capable of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or BAC). Unacceptable phase rotation shall be indicated on the LCD; the service required LED and the annunciation through the communication protocol and dry contacts. In addition the phase rotation sensing shall be capable of being disabled, if required. | | | | |
| F. The controller shall be capable of detecting a single phasing condition of a source even though a voltage may be regenerated by the load. This condition is a loss of phase and shall be considered a failed source. | | | | |
| G. Source status screens shall be provided for both normal and emergency to provide digital readout of voltage on all 3 phases (phase to phase and phase to neutral), frequency, and phase rotation. | | | | |
| TIME DELAYS: | | | | |
| A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 12 or 24 VDC power supply. | | | | |
| B. A time delay shall be provided on transfer to the emergency source, adjustable from 0 to 60 minutes for controlled timing of transfer of loads to emergency. | | | | |
| C. A time delay shall be provided on a re-transfer to normal. The timed delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable. | | | | |
| D. A time delay activated output signal shall also be provided to drive external relays for selective load disconnect and reconnect control. The controller shall be capable of controlling a maximum of 9 individual output time delays to step loads on after a transfer occurs. Each output may be individually programmed for their own time delay of up to 60 minutes. Each sequence shall be independently programed for transferring from normal to emergency and transferring from emergency to normal. | | | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| E. The controller shall also include the following built-in delays for the following operations: <ul style="list-style-type: none"> • 0 to 60 minute time delay on failure to acquire the acceptable electrical parameters from the emergency source. • 10 seconds to 15 minute delay for a failure to synchronize on an in-phase operation. | | |
| F. All time delays shall be adjustable in 1 second increments. | | |
| G. All time delays shall be adjustable by using the display and keypad with a remote device connected to the communications interface port or USB. | | |
| H. Each time delay shall be identified and a dynamic countdown shall be shown on the display. Active time delays can be viewed with a remote device connected to the communications interface port or USB. | | |
| ADDITIONAL FEATURES: | | |
| A. The controller shall have 3 levels of security. Level 1 shall allow monitoring of settings and parameters only. The level 1 shall be capable of restricted with the use of a lockable cover. Level 2 shall allow test functions to be performed and level 3 shall allow setting of all parameters. | | |
| B. The display shall provide for the test functions allowed through password security. The test function shall be load, no load or auto test. The auto test function shall request an elapsed time for test. At the completion of this time delay the test shall be automatically ended and a retransfer sequence shall commence. All loaded tests shall be immediately ended and retransfer shall occur if the emergency source fails and the normal source is acceptable. | | |
| C. A contact closure shall be provided for a low voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output and run for the duration of the cool down setting regardless of whether the normal source restores before the load is transferred. | | |
| D. Auxiliary contacts shall be provided consisting of a minimum of two contacts, closed when the ATS is connected to the normal source and two contacts closed when the ATS is connected to the emergency source. | | |
| E. LED indicating lights shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). | | |
| F. LED indicating lights shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal (green) and emergency sources (red) as determined by the voltage, frequency, and phase rotation sensing trip and reset settings for each source. | | |
| G. A membrane switch shall be provided on the membrane panel to test all indicating lights and display when depressed. | | |
| H. Provide ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load. | | |
| I. Terminals shall be provided for a remote contact which opens to signal the | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| ATS to transfer to emergency and for the remote contacts which closes to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad, communications interface port or USB. A “not-in-auto” LED shall indicate anytime the controller is inhibiting transfer from occurring. | | |
| J. An in-phase monitor shall be a standard feature in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The in-phase monitor shall be specifically designed for and be the product of the ATS manufacturer. The in-phase monitor shall be capable of being enabled or disabled from the user interface, communications interface port or USB. | | |
| K. A time based load control feature shall be available to allow the prioritization addition and removal of loads based during transfer. This feature may be enabled for either or both sources. The user shall be able to control up to nine loads with independent timing sequences for pre and post transfer delays in either direction of transfer. | | |
| <p>L. The controller shall provide 2 inputs for external controls that can be programmed from the following values:</p> <ul style="list-style-type: none"> • Common fault-Remote test • Inhibit transfer-Low battery voltage • Peak shave-Time delay bypass • Load shed forced to OFF position (programmed transition only) <p>The controller shall provide two from “C” contact outputs rated for up to 12A @ 240 VAC or 2A @ 480 VAC that can be programmed from the following values:</p> <ul style="list-style-type: none"> • Aux switch open—Transfer switch aux contact fault • Alarm silenced—Alarm active • I/O communication loss—Contactor position • Exercise active—Test mode active • Fail to transfer—Fail to acquire standby source • Source available—Phase rotation error • Not in automatic mode—Common alarm • In phase monitor sync—Load bank control active • Load control active—Maintenance mode active • Non-emergency transfer—Fail to open/close • Loss of phase—Over/under voltage • Over/under frequency—Voltage unbalance • Start signal—Peak shave active • Preferred source supplying load—Standby source supplying load • The controller shall be capable of expanding the number of inputs and outputs with additional modules. Optional input/output modules shall | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| be furnished with mount on the inside of the enclosure to facilitate ease of connections. | | |
| <p>M. Engine Exerciser: The controller shall provide an integral engine exerciser. The engine exerciser shall allow the user to program up to 21 different exercise routines based on the calendar mode. For each routine, the user shall be able to do the following:</p> <ul style="list-style-type: none"> • Enable or disable the routine • Enable or disable transfer of the load during routine • Set the start time, time of day, time of week, week of month • Set duration of the run • At the end of the specified loaded exercise duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. All loaded exercises shall be immediately ended and retransfer shall occur if the standby source fails. The next exercise period shall be displayed on the main screen with type of exercise, time, and date. The type of exercise and the time remaining shall be display when the exercise is active. It shall be possible of ending the exercise event with a single button push. | | |
| N. Date & Time: the date shall automatically adjust for leap year and the time shall have the capability of automatically adjusting for daylight saving and standard times. | | |
| <p>O. System Status: the controller shall have a default display the following on:</p> <ul style="list-style-type: none"> • System status • Date, time and type of the next exercise event • Average voltage of the preferred and standby sources <p>Scrolling through the displays shall indicate the following:</p> <ul style="list-style-type: none"> • Line of line and lone to neutral voltages for both sources • Frequency of each source • Load current for each phase • Single or three phase operation • Type of transition • Preferred source • Commit or no commit modes of operation • Source/source mode • In phase monitor enable/disable • Phase rotation • Date and time | | |
| P. Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operators manual shall not be acceptable. | | |
| Q. Self-Diagnostics: The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| the status input signals to the controller which may be preventing load transfer commands from being completed. | | |
| R. Communications Interface: The controller shall be capable of interfacing through a standard communications with a network of transfer switches and generators. It shall be able to be connected via an RS-485 serial communication (up to 4,000' direct connect or multi-drop configuration). This module shall allow for seamless integration of existing or new communication transfer devices and generators. | | |
| S. The transfer switch shall also be able to interface to third party applications using Modbus RTU open standard protocols utilizing Modbus register maps. Proprietary protocols shall not be acceptable. | | |
| T. The controller shall contain a USB port for use with software diagnostic application available to factory authorized personnel for downloading the controller's parameters and settings; exercise event schedules; maintenance records and event history. The application can also adjust parameters on the controller. | | |
| <p>U. Data Logging: The controller shall have the ability to log data and to maintain the last 2,000 events even in the event of total power loss. The following events shall be time and date stamped and maintained in a non-volatile memory. The controller shall be able to display up to the last 99 events. The remaining events shall be accessible via the communications interface port or USB.</p> <p>a. Event Logging</p> <ul style="list-style-type: none"> • Data, date, and time indication port or USB <p>b. Statistical Data</p> <ul style="list-style-type: none"> • Total number of transfers* • Total number of fail to transfers* • Total number of transfers due to preferred source failure* • Total number of minutes of operation* • Total number of minutes in the standby source* • Total number of minutes not in the preferred source* • Normal to emergency transfer time • Emergency to normal transfer time • System start date • Last Maintenance date <p>*The statistical data shall be held in two registers. One register shall contain data since start up and the second register shall contain data from the last maintenance reset.</p> | | |
| V. External DC Power Supply: An optional provision shall be available to connect up to two external 12/24 VDC power supply to allow the LCD and the door mounted control indicators to remain functional when both power sources are dead for extended periods of a time. This module shall contain reverse battery connection indication and circuit protection. | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| MANUFACTURER'S RESPONSIBILITY: | | |
| A. The supplier shall be able to provide the services of a field technician to test and demonstrate and train the operating personnel. | | |
| B. The Authority shall have the option of witnessing the demonstration of the system. Notification shall be provided one week prior to the test and demonstration. Submittal shall include specification sheets showing all standard and optional accessories to be supplied: schematic, wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set and the transfer switch. | | |
| C. Each transfer switch shall be provided with an operator's manual providing installation and operating instructions. | | |
| D. Each automatic transfer switch and generator set shall be warranted by the generator set manufacturer for one year from the date placed in service. | | |
| PAINT: | | |
| A. All steel parts shall have the mill scale and oil removed by means of a high-pressure chemical cleaner prior to painting. These surfaces shall be primed with a zinc rich, rust preventive primer. The finish paint shall be a high quality, high solid, polyurethane type enamel. All painting shall be done in conjunction with good commercial practices. | | |
| B. Enclosure Color: Manufacturer's Standard. | | |
| C. Generator and Transfer Switch: Manufacturer's Standard. | | |
| MANUALS/ELECTRICAL DIAGRAM: | | |
| A. One (1) service manual, one (1) parts manual, and one (1) electrical diagram for each unit shall be supplied at time of delivery. | | |
| <u>NOTE:</u> GENERATOR AND TRANSFER SWITCH MUST BE DELIVERED AT THE SAME TIME. NO EXCEPTIONS | | |

[illegible]

Date _____

NEW JERSEY TURNPIKE AUTHORITY

GENERAL INSTRUCTIONS AND SPECIFICATIONS FOR: STAND-BY 80 KW DIESEL-POWERED GENERATOR AND ACCESSORIES

| Quantity | Description | Maximum Delivery Date |
|----------|--|---------------------------------|
| 3 | Stand-by 80KW Diesel-Powered Generator and Accessories | 120 Days After Receipt of Order |

SPECIFICATIONS: SBDPG-2106 STAND-BY 80KW DIESEL-POWERED GENERATOR AND ACCESSORIES

COMPLIANCE WITH RULES AND REGULATIONS: The units must meet all current OSHA, ANSI, PEOSHA, NFPA 99, NFPA 110, National Electrical Code, and all other applicable regulations. The New Jersey Turnpike Authority reserves the right to request certification indicating the unit bid has been certified and tested to meet these requirements with proper documents attesting to said Certification.

ENERGY STAR REQUIREMENTS: If applicable for items specified in the bid package, the vendor must provide products that earn Energy Star Certification and meet the Energy Star specifications for energy efficiency. The vendor is encouraged to visit energystar.gov for complete product specifications and updated lists of qualifying products. The Energy Star label must also be affixed to each delivered item. The bidder's signature on the signature page certifies that items so indicated that have earned Energy Star and meet the Energy Star specifications or other standards for energy efficiency will be supplied.

ERRORS AND OMISSIONS: Inadvertent omissions or errors in the attached specifications must be brought to the attention of the New Jersey Turnpike Authority's Director of Procurement and Materials Management at 732-750-5300 before bid submission date. If, with knowledge of such error or omission and prior to the correction thereof, the bidder proceeds with any work affected hereby, they shall do so at their own risk and the work so done shall not be considered as work done under and in performance of this Agreement unless and until approved and accepted.

DELIVERY INSTRUCTIONS:

- I. Vendor must contact Peter Perperas (Project Supervisor) at 732-442-8600 ext. 2868 for authorization to schedule date and time prior to delivery. **Deliveries shall be made to the NJTA Garden State Parkway Division's District 5 Telegraph Hill Central Maintenance Facility located at GSP Exit 116 in Holmdel, NJ 07733.**
- J. Vendor shall be responsible for all delivery, shipping and pick-up expenses.

K. All units must be pre-delivery serviced, completely assembled, operational, and cleaned prior to delivery.

L. The following administrative package **must** accompany all deliveries:

- Invoice: purchase order number must be displayed on vendors invoice. Invoice shall have current date and be hand delivered to Peter Perperas (400 King George Rd Woodbridge, NJ 07095) after final acceptance of complete order.
- Warranty forms properly executed.
- Four (4) keys for each unit shall be furnished. **NO EXCEPTIONS**
- **Generator and Transfer Switch must be delivered at the same time. NO EXCEPTIONS**

WARRANTY: All units delivered must be guaranteed to be free from defects in materials, design and workmanship for a minimum of one (1) year with an additional warranty of four (4) years parts and labor from the time of acceptance by the New Jersey Turnpike Authority. All warranties shall start upon written acceptance of units by the New Jersey Turnpike Authority. Warranty must include service availability from any manufacturers authorized dealer establishment most closely located to Parkway and Turnpike area. This repair facility may not be further than 100 miles from the Central Maintenance Facility in Holmdel, NJ 07733 or the Central Shops Maintenance Facility located in Hightstown, NJ 08520. If warranty service is required, the vendor who supplied the unit shall provide for pickup, delivery and repair of unit at no charge to the New Jersey Turnpike Authority. The vendor shall also have a program to include an in-house warranty. All warranty periods shall start from date of acceptance of unit by the New Jersey Turnpike Authority.

EXCEPTION SHEET: Exception sheet is furnished with each set of specifications. Bidders making exceptions must note exceptions by item and indicate substitution in lieu and submit with bid, detailed specifications on the substitution. If the vendor is submitting an alternate product, component, feature or part to what is referenced in the specifications, the proposals **must** be accompanied by descriptive literature, marked and indicate the exact items to be furnished, with an engineering drawing of the same. **Failure to supply information requested may result in rejection of bid.** Where no exception is taken, the word "None" shall be neatly printed or typed on the exception sheet. **Failure to supply information and/or failure to complete the bidder's exception spaces in the prescribed manner may disqualify bid. It shall be understood that if no exception is taken, the vendor shall supply all material exactly as specified. No substitution will be permitted after receipt of bids.**

MANUFACTURER'S PRODUCTION SHEET: The vendor shall furnish one (1) copy of the actual Factory Production Sheet for each unit provided. The copies of the Factory Production Sheet shall be submitted at the time of the Authority's inspection of the unit.

TRAINING: It shall be the responsibility of the successful bidder to supply all safety, operational and service training to New Jersey Turnpike Authority personnel in accordance with all applicable ANSI and OSHA regulations. The safety and operational training shall consist of a complete review and understanding of the manufacturer's owner manual, along with actual operation of equipment. The instructor shall emphasize all proper uses for safe operation. The training shall include but not limited to all general troubleshooting of the hydraulic system and associated electronics. The instructor shall also emphasize the proper use of tools and test equipment along with general shop safety. The service seminars shall be similar to factory and manufacture type schools. The training shall be scheduled and take place at one (1) site designated by the New Jersey Turnpike Authority.

LABELS: Plastic stick-on labels shall not be acceptable.

ADVERTISEMENTS: No Dealer advertisements shall appear on unit or any other related equipment.

ACCESSORIES: All accessories shall be manufacturer installed when the item is available from the manufacturer.

FACILITIES: Bidders shall represent a manufacturer, which has in operation a factory adequate for the manufacture of the equipment, which it proposes to furnish. The manufacture(s) whose associated equipment or products are bid shall have a full service warranty and parts supply facility that can guarantee availability of parts within 24 hours after telephone order and shall be located within a 100 mile radius of either Central Shops Maintenance Facility (exit 8 on the NJ Turnpike) located in Hightstown, NJ 08520 or Telegraph Hill Maintenance Facility (exit 116 on the GSP) located in Holmdel, NJ 07733. This facility will be required to establish an in-house warranty program and provide all warranty work related to the equipment in the bid proposal. The bidder shall submit the locations, names and telephone numbers of people who are authorized to service the equipment or who can be reached for emergency service.

Location_____

Phone #_____

Contact_____

Name & Title

**SPECIFICATIONS: SBDPG-2016
STAND-BY 80 KW DIESEL-POWERED GENERATOR
AND ACCESSORIES**

INTENT: It is the intent of this specification to describe and govern the purchase of a Stand-By 80 KW Diesel-Powered Generator and Accessories. The components including the completed unit shall be new and of the latest design and be in current production at the time of the submission of bid. No bid shall be considered unless the vendor submitting the bid can meet the following conditions. All standard and optional equipment shall be Original Equipment Manufacturer (OEM) items, when available. **NO EXCEPTIONS**

BIDDER'S INSTRUCTIONS

IT SHALL BE THE BIDDER'S RESPONSIBILITY TO CAREFULLY EXAMINE EACH ITEM OF THE SPECIFICATION. BIDDERS MUST INDICATE WHETHER THEY COMPLY OR NON-COMPLY FOR EACH LINE ITEM IN THE SPECIFICATION. FAILURE TO PROVIDE A COMPLETED BID MAY CAUSE REJECTION OF BID. ALL NON-COMPLY RESPONSES AND/OR BIDDERS PROPOSED "APPROVED EQUIVALENTS" MUST BE FULLY EXPLAINED ON EXCEPTION FORM, NOTING SECTION AND ITEM. FAILURE TO EXPLAIN NON-COMPLY RESPONSES OR FAILURE TO SUPPLY DETAILED LITERATURE/BROCHURES ON THE BIDDERS PROPOSED "APPROVED EQUIVALENTS" MAY CAUSE REJECTION OF BID. WHERE "MINIMUM/MAXIMUM" IS SPECIFIED, BIDDERS MUST PROPOSE AT LEAST THE MINIMUM/MAXIMUM SIZES OR THE BID MAY BE REJECTED.

| | COMPLY | |
|--|---------------|-----------|
| | YES | NO |
| SUBMITTALS: | | |
| A. The contractor shall furnish data showing manufacturer's model numbers, dimensions and weights for the engine, generator, enclosure, including major auxiliary equipment, to include the following listed below B thru I. | | |
| B. Engine generator set, including sales literature and elevation drawings clearly showing entrance points and interconnections. | | |
| C. Fuel consumption curves published kw ratings, combustion air (cfm) requirements. | | |
| D. Dimensions for the generator set enclosure, showing access points, and confirmation concerning fastener sizes, material sizes, hinge sizes, and door latch details shall be supplied as specified. | | |
| E. Exhaust silencer, manufacturer's name and model number including details for the flex, 90° degree exhaust elbow and rain cap. | | |
| F. Battery racks, battery size and amp hour rating. | | |
| G. Drawing showing the load take-off provisions including access points to service the machine. | | |
| H. Electrical diagrams and schematics for all equipment supplied. | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| I. Guards shall be provided over all exposed moving parts as required by OSHA. | | |
| TESTING: | | |
| A. The manufacturer shall be responsible for design prototype tests as described herein. | | |
| B. Components of the emergency system, such as the engine/generator set, transfer switch, and accessories shall not be subjected to prototype tests since the tests are potentially damaging. | | |
| C. Prototype test programs shall include the requirements of NFPA-99 and NFPA-110 and the following: <ul style="list-style-type: none"> • Maximum power (kw). • Maximum motor starting (kva) at 35% instantaneous voltage dip. • Alternator temperature rise by embedded thermocouple and by resistance method per NEMA MG1-32.40. • Governor speed regulation under steady-state and transient conditions. • Voltage regulation and generator transient response. • Fuel consumption at 1/4, 1/2, 3/4, and full load. • Harmonic analysis, voltage waveform deviation, and telephone influence factor. • 3-Phase short circuit test. • Alternator cooling air flow. • Torsional analysis testing to verify that the generator set is free of harmful torsional stresses. • Endurance testing. • After assembly and prior to painting, a certified two (2) hour 100% load test is to be performed. Record each 1/4 hour kw rating, water temp, oil pressure, ambient and fuel consumption. The test is to include three (3) transient response reports at 50%, 75% and 100% load. Reports are to be type written and certified to be true and correct. The NJTA reserves the right to witness the test. | | |
| GENERAL: | | |
| A. Kohler Model 80REOZJF with a 4R9X generator or approved equivalents. | | |
| I B. Provide 80 kw at 120/208, 3-phase. The generator set shall be capable of this rating while operating in an ambient condition of 77°F and 8,200' above sea level. | | |
| C. It shall provide 83kW/103.75kVA when operating at 120/208 volts, 60Hz, .8 power factor. | | |
| D. The generator set shall be capable of supplying 289 LRKVA for starting motor loads with a maximum instantaneous voltage dip of 35% as measured by a digital RMS transient recorder in accordance with IEEE standard 115. | | |
| C. E. Vibration isolators shall be provided between the engine-alternator and | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| heavy-duty steel base. | | |
| ENGINE: | | |
| A. The minimum 275 cubic inch displacement engine shall deliver a minimum of at least 130 hp at a governed speed of 1,800 rpm. | | |
| B. Replaceable fuel filters and electric fuel shut-off valve. | | |
| C. Isochronous governor capable of 0.25% steady state frequency. | | |
| D. 12-volt positive engagement solenoid shift-starting motor. | | |
| E. 65-amp automatic battery charging alternator with solid-state voltage regulation. | | |
| F. Positive displacement, full pressure lubrication oil pump, replaceable cartridge oil filters, dipstick, and oil drain. | | |
| G. Dry-type replaceable air cleaner elements. | | |
| H. Turbo-charged engine shall be fueled with diesel, 4-cylinders and liquid cooled. | | |
| ALTERNATOR: | | |
| A. The alternator shall be salient-pole, brushless, 12-lead re-connectable, self-ventilated of drip-proof construction with amortisseur rotor windings and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) for temperature rise limits. Temperature rise of the rotor and stator shall be limited to 130°C. The excitation system shall be of brushless construction controlled by a solid- state voltage regulator capable of maintaining voltage within +/- .20% at any constant load from 0% to 100% of rating. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full load. The TIF factor shall not exceed 50. | | |
| B. The generator shall be inherently capable of sustaining at least 250% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current support devices. | | |
| C. The alternator having a single maintenance-free bearing designed for 40000 hour B10 life. Shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel. | | |
| CONTROLLER: | | |
| A. Decision Marker 3000 or approved equivalent Generator Set Controller. | | |
| B. The generator set controller shall be a microprocessor based control system that shall provide automatic starting, system monitoring and protection. The controller shall also provide local monitoring and remote monitoring. The control system shall be capable of PC based updating of all necessary parameters, firmware, and software. | | |
| C. The controller shall be mounted on the generator set and shall have integral vibration isolation. The controller shall be prototype and reliability tested to ensure operation in the conditions encountered. | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| CONTROLLER BUTTONS, DISPLAY & COMPONENTS: | | |
| <p>A. The generator set controller shall include the following features and functions:</p> <p>Push button master control buttons. The buttons shall have an indicator light to initiate the following functions:</p> <ul style="list-style-type: none"> • Run Mode—when in run mode the generator set shall start as directed by the operator. • Off/Reset Mode—when in the off/reset mode the generator set shall stop, the reset shall reset all faults allowing for the restarting of the generator set after a shutdown. • Auto Mode—when in auto mode the generator set shall be ready to accept a signal from a remote device. | | |
| B. Emergency Stop Switch: the remote stop switch shall be red in color with a “mushroom” type head. Depressing the button shall immediately stop the generator set and lockout the generator set for any automatic remote starting. | | |
| C. Push Button/Rotary Selector Dial: this dial shall be used for selection of all menus and sub-menus. Rotating the dial shall move you through the menus, pushing the dial selects the menu and functions/features in that menu. Pushing the button selects the feature/function and sub-menus. | | |
| D. Digital Display: the digital display shall be alphanumeric with 2 lines of data and approximately 24 characters. The display shall have back-lighting. The display shall display status of all faults, warnings and engine faults. While the generator set is running the display shall scroll all important information across the screen. The scroll can be stopped by pushing the rotary dial. The display shall go to sleep when the generator set is not running and will wake-up when the generator set starts or the rotary dial is depressed. | | |
| E. Fault Light: the controller shall have an annunciator fault light that glows red for faults and yellow for warnings. These faults and warnings shall be displayed in the digital display. The fault light shall also glow yellow when not in auto. | | |
| F. Alarm Horn: the controller shall provide an alarm horn that sounds when any faults or warnings are present. The horn shall also sound when the controller is not in the auto mode. | | |
| G. Alarm Silence/Lamp Test Button: when this button is depressed it shall test all controller lamps. This button shall silence the alarm horn when the unit is not in auto. | | |
| H. USB Connection: the controller shall have a USB connection on the face of the controller. This connection shall allow for updating of all software and firmware. This port shall also allow for all servicing of generator set parameters, fault diagnostics and viewing of all controller information by use of a laptop computer. | | |
| I. Dedicated User Inputs: the controller shall have dedicated inputs for remote emergency stop switch, remote 2-wire star for transfer switch and auxiliary | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| shutdown. | | |
| J. The controller shall have auto resettable circuit protection integral on the circuit board. | | |
| SYSTEM CONTROLLER MONITORING & STATUS FEATURES & FUNCTIONS: | | |
| A. The generator controller shall display and monitor the following engine and alternator functions and allow adjustments of certain parameters at the controller: | | |
| B. Over Menu: <ul style="list-style-type: none"> • Active shutdowns and warnings shall be displayed if present and without the need of operator interface. • Engine runtime with total hours. • Average line to line voltage. • Coolant temperature. • Fuel level or pressure. • Oil pressure. • Battery voltage. • Software version. • Frequency. • Average current. | | |
| C. Engine Metering Menu: <ul style="list-style-type: none"> • Engine speed. • Oil pressure. • Coolant temperature. • Battery voltage. | | |
| D. Generator Metering Menu: <ul style="list-style-type: none"> • Total power in VA. • Total power in W. • Rated power % used. • Voltage L-L and L-N for all phases. • Current L1, L2, L3. • Frequency. | | |
| E. Generator Set Information: <ul style="list-style-type: none"> • Generator set model number. • Generator set serial number. • Controller set number. | | |
| F. Generator Set Run Time: <ul style="list-style-type: none"> • Engine run time total hours. • Engine loaded total hours. • Number of engine starts. • Total energy in kW. | | |
| G. Generator Set System: | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| <ul style="list-style-type: none"> • System voltage. • System frequency 50/60Hz. • System phase, single/three phase. • Power rating kW. • Amperage rating. • Power type standby/prime. • Measurement units, metric/English units adjustable. • Alarm silence, always or auto only. | | |
| H. Generator Set Calibration, the following shall be adjustable at the controller: <ul style="list-style-type: none"> • Voltage L-L and L-N all phases. • Current L1, L2, L3. • Reset all calibrations. | | |
| I. Voltage Regulation, +/-0.5% regulation, the following shall be adjustable at the controller: <ul style="list-style-type: none"> • Voltage adjustable +/-10%. | | |
| J. Digital & Analog Inputs & Outputs: <ul style="list-style-type: none"> • Displays settings and status. | | |
| K. Event Log: <ul style="list-style-type: none"> • Store event history up to 1,000 events. | | |
| CONTROLLER ENGINE CONTROL FEATURES & FUNCTIONS: | | |
| A. Automatic restart—the controller shall have an automatic restart feature which shall initiate the start routine and re-crank after a failed start attempt. | | |
| B. Cyclic cranking—the controller shall have programmable cyclic cranking. | | |
| C. Engine starting aid—the controller shall have the capability of providing control for an optional engine starting aid. | | |
| D. The control system shall include time delays for engine start and cool down. | | |
| E. The control system shall interface with the engine ECM and display engine fault codes and warnings. The ECM shall also include sender failure monitoring to help distinguish between failed senders and actual failure conditions. | | |
| F. The controller shall monitor and display engine governor functions include steady state and transient frequency monitoring. | | |
| CONTROLLER ALTERNATOR CONTROL FEATURES & FUNCTIONS: | | |
| A. Integrated hybrid voltage regulator—the system shall have integral microprocessor based voltage regulator system that shall provide +/- 5% voltage regulation, no load to full load with three phase sensing. The system shall be prototype tested and control variation of voltage to frequency. The voltage regulator shall be adjustable at the controller with maximum +/- 10% adjustable of nominal voltage. | | |
| B. AC output voltage regulator adjustment—the system shall allow for | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| adjustment of the integral voltage regulator with maximum of +/- 10% adjustment of the system voltage. | | |
| C. Alternator thermal overload protection—the system shall have integral alternator overload and short circuit protection matched to each alternator for the particular voltage and phase configuration. | | |
| D. Power metering—the controller digitally shall display power metering of kW and kVA. | | |
| E. Event logging—the controller shall keep a record of up to 1,000 events for warning and shutdown faults. This fault information shall be a stored record of systems events and can be reset. | | |
| F. Historical data logging—the controller total number of generator set successful start shall be recorded and displayed. | | |
| G. Programmable access—the control system shall include a USB port that gives service tech the ability to provide software and firmware upgrades. The system shall also be capable of allowing setting of all critical parameters using the service software and a laptop computer. All parameters and setting should be capable of being stored on a laptop for future upgrades of printing for analysis. | | |
| GENERATOR SET WARNING, SHUTDOWN ALARM & STATUS: | | |
| A. The generator set shall have alarms and status indication lamps that show non-automatic status and warning and shutdown conditions. The controller shall indicate with a warning lamp and or alarm and on the digital display screen any shutdown, warning or engine fault condition that exists in the generator set system. | | |
| B. Engine Functions: <ul style="list-style-type: none"> • High fuel level (alarm). • ECM communication loss (shutdown). • ECM diagnostics (alarm & shutdown). • Engine over-speed (shutdown). • Engine start aid active. • Engine under-speed (shutdown). • Fuel tank leak (alarm & shutdown). • High DC battery voltage (alarm). • High coolant temperature (alarm & shutdown). • Low DC battery voltage (alarm). • Low coolant level (shutdown). • Low coolant temperature (alarm). • Low cranking voltage (alarm). • Low engine oil level (alarm & shutdown). • Low fuel level (alarm & shutdown). • Low fuel pressure (alarm). • Low oil pressure (alarm & shutdown). • No coolant temperature signal (shutdown). | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| <ul style="list-style-type: none"> • No oil pressure signal (shutdown). • Over-crank (shutdown). • Speed sensor fault (alarm). | | |
| <p>C. Generator Functions:</p> <ul style="list-style-type: none"> • AC sensing loss over & under current (alarm & shutdown). • Alternator protection (shutdown). • Ground fault input (alarm). • kW overload (shutdown). • Locked rotor (shutdown). • Over-frequency (shutdown). • Over AC voltage (shutdown). • Under-frequency (shutdown). • Under AC voltage (shutdown). • Emergency stop (shutdown). | | |
| <p>D. General Functions:</p> <ul style="list-style-type: none"> • Battery charger fault (alarm). • Common fault (shutdown). • Common warning (alarm). • Master switch not in auto (alarm). • Generator running. • Input/output fault (alarm). | | |
| <p>E. The generator set controller shall also be capable of meeting all necessary NFPA 110 level 1 requirements which shall include several of the above along with; EPS supplying load, Master switch no in auto and contacts for local and remote common alarm.</p> | | |
| ACCESSORIES: | | |
| <p>A. Air restriction indicator shall indicate the need for maintenance of the air cleaners.</p> | | |
| <p>B. Standard air cleaner shall provide engine air filtration which meets the engines manufacturer's specifications.</p> | | |
| <p>C. Battery charger: 6-ampere float to equalize battery charger with the following features:</p> <ul style="list-style-type: none"> • 12 VDC output. • 1% steady-state voltage regulation from no load to full load over 10% AC input line voltage variation. • LED lamps for charge state indication. • Temperature compensated for ambient temperatures for -40°C to 70°C. • Potting for durability. • Short circuit and reverse polarity protection. • UL 1236 listed. | | |
| <p>D. Battery rack and battery cables shall be capable of holding the</p> | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| manufacturers recommended batteries shall be supplied. | | |
| E. Circuit Breaker: the generator shall come with a primary factory installed 80% rated line circuit breaker of 200 amperes that is UL2200 listed. Line circuit breakers shall be sized for the rated ampacity of the genset. Load side lugs shall be provided. The line circuit breaker shall include auxiliary contacts, shunt trip, under voltage trip, alarm switch, and over current switch functionality. Load side breaker connections made at the factory shall be separated from field connections. When GFI breakers are required additional neutrals shall be factory installed. | | |
| F. Flexible exhaust piping shall be gas proof, seamless, stainless steel. | | |
| G. The engine exhaust silencer shall be temperature and rust resistant and rated for critical applications. Silencer shall reduce total engine exhaust noise by 25-35 dba. | | |
| H. Block heater of proper wattage and voltage thermostatically controlled to maintain engine coolant temperature to meet the start-up requirement of NFPA-99 or NFPA-110 regulations, Level 1. | | |
| I. Rodent guards shall be supplied preventing intrusion and protect internal components. | | |
| J. Generator heater shall be supplied and prevent the accumulation of moisture and dampness in the generator windings. The heater shall be wired on at all times. | | |
| K. Run Relay: the run relay shall provide a three-pole, double throw relay with 10-amps/250 VAC contacts to indicate that the generator is running. The relay shall provide three (3) sets of dry contacts for energizing or de-energizing devices while the generator is running e.g. indicator lamps, louvers, etc. | | |
| L. 2-Input/5-Output Module: the 2-input /5output module kit shall provide two (2) additional analog inputs and 5 additional dry contact outputs. The analog inputs can be used for analog or digital input functions. They can be set up for 0-5VDC, +/-3VDC resistive or relay contact sensor devices. The dry contact outputs are arranged as two 120VAC or 28VDC, 10A from C contacts and three 28VDC, 2A form C contacts. Input and output functions are user defined using Site Tech software. | | |
| DOUBLE WALL SECONDARY CONTAINMENT SUB BASE FUEL TANK: | | |
| A. A sub base fuel tank used in conjunction with a diesel powered generator set of 80kW shall contain at least 345 gallons of fuel to support the generator set for a period of 48 hours at 100% of rated load and 59 hours at 75% of rated load. | | |
| B. The sub base fuel system shall be listed under UL 142, subsection entitled Special Purpose Tanks EFVT category and will bear their mark of UL Approval according to the their particular classification. | | |
| C. The above ground steel secondary containment rectangular tank for use as a sub base for diesel generators is manufactured and intended to be installed in accordance with the Flammable and Combustible Liquids Code—NFPA 30. | | |

| | COMPLY | |
|---|---------------|-----------|
| | YES | NO |
| The Standard for Installation and Use of Stationary Combustible Engine and Gas Turbines—NFPA 37, and Emergency and Standby Power Systems—NFPA 110. | | |
| D. Primary Tank: <ul style="list-style-type: none"> Rectangular in shape and constructed in clam shell fashion to ensure maximum structural integrity and allow the use of a full throat fillet weld. | | |
| E. Steel Channel Support System: <ul style="list-style-type: none"> Reinforced steel box channel for generator support with a load rating of 5,000 lbs. per generator mounting hole location. Full height gussets at either end of channel and at generator mounting holes shall be utilized. | | |
| F. Exterior Finish: <ul style="list-style-type: none"> The exterior coating shall be tested to withstand continuous salt spray testing at 100% exposure to 244 hours to a 5% salt solution at 92-97° F. The coating shall be subjected to full exposure humidity testing to 100% humidity at 100° F for 24 hours. | | |
| G. Venting: <ul style="list-style-type: none"> Normal venting shall be sized in accordance with the American Petroleum Institute Standard # 2000, Venting Atmospheric and Low Pressure Storage Tanks not less than 1¼" nominal inside diameter. | | |
| H. Emergency Venting: <ul style="list-style-type: none"> The emergency vent opening shall be sized to accommodate the total capacity of both normal and emergency venting and shall be not less than that derived from NFPA 30, table 2-8 and based on the wetted surface area of the tank. The wetted area of the tank shall be calculated on the basis of 100% of the primary tank. The vent shall be spring-pressure operated: opening pressure is 0.5/psig and full opening pressure is 2.5 psig. The emergency relief vent shall be sized to accommodate the total venting capacity of both normal and emergency vents. | | |
| I. Fuel Fill: <ul style="list-style-type: none"> There shall be a 2" NPT opening within the primary tank and lockable manual fill cap. | | |
| J. Fuel Level: <ul style="list-style-type: none"> A direct reading, UL listed magnetic fuel level gauge with a hermetically sealed vacuum tested dial shall be provided to eliminate fogging. | | |
| K. Low Fuel Level Switch: <ul style="list-style-type: none"> Shall consist of a 30-watt float switch for remote or local annunciation of a 50% standard low fuel level condition. | | |
| WEATHER ENCLOSURE: | | |
| A. All enclosures shall be constructed from high strength, low alloy steel, | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| aluminum or galvanized steel. | | |
| B. The enclosure shall be finish coated with powder baked paint. Enclosures shall be finished with the manufacturer's standard color. | | |
| C. The enclosures shall allow the generator set to operate at full load in an ambient temperature of 40-50° C with no additional derating of the electrical output. | | |
| D. Enclosures shall be equipped with sufficient side and end doors to allow access for operation, inspection, and service of the unit. Minimum requirements are two (2) doors per side. When the generator set controller faces the rear of the generator set, an additional rear facing door shall be required. Access to the controller and main line circuit breaker shall meet the requirements of the National Electric Code. | | |
| E. Doors shall be equipped with lockable latches. Locks shall be keyed alike. | | |
| F. A duct between the radiator and air outlet shall be provided to prevent re-circulation of hot air. | | |
| G. The complete exhaust system shall be internal to the enclosure or optional with external mounted silencer. | | |
| H. The critical silencer shall be insulated with a tailpipe and rain cap. | | |
| INSTALLATION: | | |
| A. The equipment shall be installed by New Jersey Turnpike Division personnel. The successful bidder shall provide a full set of manufacturer's plans, specifications and schematics for installation to the Authority, within three (3) days of notice of intent to award. Any additional recommendations from the manufacturer for installation in accordance with all applicable codes must be supplied with the manufacturer's plans. | | |
| SITE TESTS: | | |
| A. An installation check, start-up, and building load test shall be performed by the manufacturer's local representative. The time and date of the site test shall be determined by the New Jersey Turnpike Division. Tests shall include the following below: | | |
| B. Fuel, lubricating oil and antifreeze shall be checked for conformity to the manufacturer's recommendations under the environmental conditions present and expected. | | |
| C. Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. This shall include engine heaters, battery charger, generator strip heaters, remote annunciator, etc. | | |
| D. Start-up under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during running, normal and emergency line-to-line voltage and phase rotation. | | |
| E. Automatic start up by means of simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch times shall be adjusted for proper systems coordination. Engine temperature, oil pressure and battery charge level along with generator | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| voltage, amperes and frequency shall be monitored throughout the test. | | |
| F. All major components (engine, generator and transfer switch) shall be manufactured in the United States. | | |
| AUTOMATIC TRANSFER SWITCH: | | |
| A. Transfer switch system with 3-pole/4-wire solid neutral (T), 200-amps, 208 volt-60Hz (c). Transfer switch shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. NEMA 4X enclosure shall be supplied. | | |
| B. Automatic transfer switch shall be a Kohler Standard Specific Breaker—Standard Transition (KSS)/KSSACTF0200S or approved equivalent. | | |
| MECHANICALLY HELD TRANSFER SWITCH: | | |
| A. The transfer switch shall be electrically operated and mechanically held with double throw construction and operated by a momentarily energized solenoid driven mechanism. Main operators shall include overcurrent disconnect devices. | | |
| B. All transfer switch sizes shall use only one (1) type of main operator for ease of maintenance and commonality of parts. | | |
| C. The switch shall be positively locked and unaffected by momentarily outages, so that contact pressure is maintained at a constant value and contact temperature rise is minimized for maximum reliability and operating life. | | |
| D. All main contacts shall be silver composition. Switches rated 600-amperes and above shall have segmented blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts. | | |
| E. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 800-amperes and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars. | | |
| F. Designs utilizing components of molded case circuit breakers, contactors, or parts, which are not intended for continuous duty, repetitive switching or transfer between two active power sources shall not be acceptable. | | |
| G. For two and three pole switches where neutral conductors are to be solidly connected as shown on the plans, a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided. | | |
| H. For four pole switches with a switching neutral, where neutral connectors must be switched as shown on the plans, the contactor shall be provided with fully rated switched neutral transfer contacts. Overlapping neutral contacts may be used as an alternative. | | |
| ENCLOSURE: | | |
| A. The automatic transfer switch (ATS) shall be furnished in a NEMA 4X enclosure. | | |
| B. All standard door mounted switches and indicating LED's shall be integrated into a flush-mounted interface membrane or equivalent in the enclosure door for easy viewing and replacement. The panel shall be capable | | |

| | COMPLY | | | | | | | | | | | | | | | | | | | |
|--|--------------|--------------------|--------------|---------------|-----------|------------|--------------|-------------|--------------------|-----------------|-----------|-----------|----------------|-------------|-------------|--------------------|----------|----------|--|--|
| | YES | NO | | | | | | | | | | | | | | | | | | |
| of having a manual locking feature to allow the user to lockout all membrane mounted control switches to prevent tampering. This cover shall be mounted with hinges and have a latch that may be padlocked. The membrane panel shall be suitable for mounting by others when furnished on open type units. | | | | | | | | | | | | | | | | | | | | |
| CONTROLLER DISPLAY & KEYBOARD: | | | | | | | | | | | | | | | | | | | | |
| A. A four line, 20 character LCD display and dynamic 4 button keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and control through the communications interface port or USB. | | | | | | | | | | | | | | | | | | | | |
| B. The following parameters shall only be adjustable by use of a password protected programming on the controller: <ul style="list-style-type: none"> • Nominal line voltage and frequency. • Single or three phase sensing. • Operating parameter protection. • Transfer operating mode configuration (Standard transition, Programmed transition or closed transition). | | | | | | | | | | | | | | | | | | | | |
| VOLTAGE FREQUENCY & SENSING: | | | | | | | | | | | | | | | | | | | | |
| A. Voltage (all phases) and frequency on both the normal and emergency sources shall be continuously monitored. Voltage on both normal and emergency sources and frequency on the emergency sources shall be adjustable with the following pickup, dropout, trip setting capabilities (values shown as % of nominal unless otherwise specified): | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Parameter</th><th>Dropout/Trip</th><th>Pickup/Reset</th></tr> </thead> <tbody> <tr> <td>Under voltage</td><td>75 to 98%</td><td>85 to 100%</td></tr> <tr> <td>Over voltage</td><td>106 to 135%</td><td>95 to 100% of trip</td></tr> <tr> <td>Under frequency</td><td>95 to 99%</td><td>80 to 95%</td></tr> <tr> <td>Over frequency</td><td>101 to 115%</td><td>105 to 120%</td></tr> <tr> <td>Voltage unbalanced</td><td>5 to 20%</td><td>3 to 18%</td></tr> </tbody> </table> | Parameter | Dropout/Trip | Pickup/Reset | Under voltage | 75 to 98% | 85 to 100% | Over voltage | 106 to 135% | 95 to 100% of trip | Under frequency | 95 to 99% | 80 to 95% | Over frequency | 101 to 115% | 105 to 120% | Voltage unbalanced | 5 to 20% | 3 to 18% | | |
| Parameter | Dropout/Trip | Pickup/Reset | | | | | | | | | | | | | | | | | | |
| Under voltage | 75 to 98% | 85 to 100% | | | | | | | | | | | | | | | | | | |
| Over voltage | 106 to 135% | 95 to 100% of trip | | | | | | | | | | | | | | | | | | |
| Under frequency | 95 to 99% | 80 to 95% | | | | | | | | | | | | | | | | | | |
| Over frequency | 101 to 115% | 105 to 120% | | | | | | | | | | | | | | | | | | |
| Voltage unbalanced | 5 to 20% | 3 to 18% | | | | | | | | | | | | | | | | | | |
| B. Repetitive accuracy of all settings shall be within +/- 0.5% over an operating temperature range of -20° C to 70° C. | | | | | | | | | | | | | | | | | | | | |
| C. an adjustable dropout time for transient voltage and frequency excursions shall be provided. The time delays shall be 0.1 to 9.9 seconds for voltage and .1 to 15 seconds for frequency. | | | | | | | | | | | | | | | | | | | | |
| D. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keyboard, remotely via the communications interface port or USB. | | | | | | | | | | | | | | | | | | | | |
| E. The controller shall be capable of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or BAC). Unacceptable phase rotation shall be indicated on the LCD; the service required LED and the annunciation through the communication protocol and dry contacts. In addition the phase rotation sensing shall be capable of being | | | | | | | | | | | | | | | | | | | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| disabled, if required. | | |
| F. The controller shall be capable of detecting a single phasing condition of a source even though a voltage may be regenerated by the load. This condition is a loss of phase and shall be considered a failed source. | | |
| G. Source status screens shall be provided for both normal and emergency to provide digital readout of voltage on all 3 phases (phase to phase and phase to neutral), frequency, and phase rotation. | | |
| TIME DELAYS: | | |
| A. An adjustable time delay of 0 to 6 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 12 or 24 VDC power supply. | | |
| B. A time delay shall be provided on transfer to the emergency source, adjustable from 0 to 60 minutes for controlled timing of transfer of loads to emergency. | | |
| C. A time delay shall be provided on a re-transfer to normal. The timed delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable. | | |
| D. A time delay activated output signal shall also be provided to drive external relays for selective load disconnect and reconnect control. The controller shall be capable of controlling a maximum of 9 individual output time delays to step loads on after a transfer occurs. Each output may be individually programmed for their own time delay of up to 60 minutes. Each sequence shall be independently programmed for transferring from normal to emergency and transferring from emergency to normal. | | |
| E. The controller shall also include the following built-in delays for the following operations: <ul style="list-style-type: none"> • 0 to 60 minute time delay on failure to acquire the acceptable electrical parameters from the emergency source. • 10 seconds to 15 minute delay for a failure to synchronize on an in-phase operation. | | |
| F. All time delays shall be adjustable in 1 second increments. | | |
| G. All time delays shall be adjustable by using the display and keypad with a remote device connected to the communications interface port or USB. | | |
| H. Each time delay shall be identified and a dynamic countdown shall be shown on the display. Active time delays can be viewed with a remote device connected to the communications interface port or USB. | | |
| ADDITIONAL FEATURES: | | |
| A. The controller shall have 3 levels of security. Level 1 shall allow monitoring of settings and parameters only. The level 1 shall be capable of restricted with the use of a lockable cover. Level 2 shall allow test functions to be performed and level 3 shall allow setting of all parameters. | | |
| B. The display shall provide for the test functions allowed through password security. The test function shall be load, no load or auto test. The auto test | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| function shall request an elapsed time for test. At the completion of this time delay the test shall be automatically ended and a retransfer sequence shall commence. All loaded tests shall be immediately ended and retransfer shall occur if the emergency source fails and the normal source is acceptable. | | |
| C. A contact closure shall be provided for a low voltage engine start signal. The start signal shall prevent dry cranking of the engine by requiring the generator set to reach proper output and run for the duration of the cool down setting regardless of whether the normal source restores before the load is transferred. | | |
| D. Auxiliary contacts shall be provided consisting of a minimum of two contacts, closed when the ATS is connected to the normal source and two contacts closed when the ATS is connected to the emergency source. | | |
| E. LED indicating lights shall be provided; one to indicate when the ATS is connected to the normal source (green) and one to indicate when the ATS is connected to the emergency source (red). | | |
| F. LED indicating lights shall be provided and energized by controller outputs. The lights shall provide true source availability of the normal (green) and emergency sources (red) as determined by the voltage, frequency, and phase rotation sensing trip and reset settings for each source. | | |
| G. A membrane switch shall be provided on the membrane panel to test all indicating lights and display when depressed. | | |
| H. Provide ability to select “commit/no commit to transfer” to determine whether the load should be transferred to the emergency generator if the normal source restores before the generator is ready to accept the load. | | |
| I. Terminals shall be provided for a remote contact which opens to signal the ATS to transfer to emergency and for the remote contacts which closes to inhibit transfer to emergency and/or retransfer to normal. Both of these inhibit signals can be activated through the keypad, communications interface port or USB. A “not-in-auto” LED shall indicate anytime the controller is inhibiting transfer from occurring. | | |
| J. An in-phase monitor shall be a standard feature in the controller. The monitor shall control transfer so that motor load inrush currents do not exceed normal starting currents, and shall not require external control of power sources. The in-phase monitor shall be specifically designed for and be the product of the ATS manufacturer. The in-phase monitor shall be capable of being enabled or disabled from the user interface, communications interface port or USB. | | |
| K. A time based load control feature shall be available to allow the prioritization addition and removal of loads based during transfer. This feature may be enabled for either or both sources. The user shall be able to control up to nine loads with independent timing sequences for pre and post transfer delays in either direction of transfer. | | |
| L. The controller shall provide 2 inputs for external controls that can be programmed from the following values: | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| <ul style="list-style-type: none"> • Common fault-Remote test • Inhibit transfer-Low battery voltage • Peak shave-Time delay bypass • Load shed forced to OFF position (programmed transition only) <p>The controller shall provide two from “C” contact outputs rated for up to 12A @ 240 VAC or 2A @ 480 VAC that can be programmed from the following values:</p> <ul style="list-style-type: none"> • Aux switch open—Transfer switch aux contact fault • Alarm silenced—Alarm active • I/O communication loss—Contactor position • Exercise active—Test mode active • Fail to transfer—Fail to acquire standby source • Source available—Phase rotation error • Not in automatic mode—Common alarm • In phase monitor sync—Load bank control active • Load control active—Maintenance mode active • Non-emergency transfer—Fail to open/close • Loss of phase—Over/under voltage • Over/under frequency—Voltage unbalance • Start signal—Peak shave active • Preferred source supplying load—Standby source supplying load • The controller shall be capable of expanding the number of inputs and outputs with additional modules. Optional input/output modules shall be furnished with mount on the inside of the enclosure to facilitate ease of connections. | | |
| <p>M. Engine Exerciser: The controller shall provide an integral engine exerciser. The engine exerciser shall allow the user to program up to 21 different exercise routines based on the calendar mode. For each routine, the user shall be able to do the following:</p> <ul style="list-style-type: none"> • Enable or disable the routine • Enable or disable transfer of the load during routine • Set the start time, time of day, time of week, week of month • Set duration of the run • At the end of the specified loaded exercise duration the switch shall transfer the load back to normal and run the generator for the specified cool down period. All loaded exercises shall be immediately ended and retransfer shall occur if the standby source fails. The next exercise period shall be displayed on the main screen with type of exercise, time, and date. The type of exercise and the time remaining shall be display when the exercise is active. It shall be possible of ending the exercise event with a single button push. | | |
| N. Date & Time: the date shall automatically adjust for leap year and the | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| time shall have the capability of automatically adjusting for daylight saving and standard times. | | |
| <p>O. System Status: the controller shall have a default display the following on:</p> <ul style="list-style-type: none"> • System status • Date, time and type of the next exercise event • Average voltage of the preferred and standby sources <p>Scrolling through the displays shall indicate the following:</p> <ul style="list-style-type: none"> • Line of line and lone to neutral voltages for both sources • Frequency of each source • Load current for each phase • Single or three phase operation • Type of transition • Preferred source • Commit or no commit modes of operation • Source/source mode • In phase monitor enable/disable • Phase rotation • Date and time | | |
| P. Controllers that require multiple screens to determine system status or display “coded” system status messages, which must be explained by references in the operators manual shall not be acceptable. | | |
| Q. Self-Diagnostics: The controller shall contain a diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed. | | |
| R. Communications Interface: The controller shall be capable of interfacing through a standard communications with a network of transfer switches and generators. It shall be able to be connected via an RS-485 serial communication (up to 4,000' direct connect or multi-drop configuration). This module shall allow for seamless integration of existing or new communication transfer devices and generators. | | |
| S. The transfer switch shall also be able to interface to third party applications using Modbus RTU open standard protocols utilizing Modbus register maps. Proprietary protocols shall not be acceptable. | | |
| T. The controller shall contain a USB port for use with software diagnostic application available to factory authorized personnel for downloading the controller’s parameters and settings; exercise event schedules; maintenance records and event history. The application can also adjust parameters on the controller. | | |
| U. Data Logging: The controller shall have the ability to log data and to maintain the last 2,000 events even in the event of total power loss. The following events shall be time and date stamped and maintained in a non- | | |

| | COMPLY | |
|---|--------|----|
| | YES | NO |
| <p>volatile memory. The controller shall be able to display up to the last 99 events. The remaining events shall be accessible via the communications interface port or USB.</p> <p>a. Event Logging</p> <ul style="list-style-type: none"> Data, date, and time indication port or USB <p>b. Statistical Data</p> <ul style="list-style-type: none"> Total number of transfers* Total number of fail to transfers* Total number of transfers due to preferred source failure* Total number of minutes of operation* Total number of minutes in the standby source* Total number of minutes not in the preferred source* Normal to emergency transfer time Emergency to normal transfer time System start date Last Maintenance date <p>*The statistical data shall be held in two registers. One register shall contain data since start up and the second register shall contain data from the last maintenance reset.</p> | | |
| V. External DC Power Supply: An optional provision shall be available to connect up to two external 12/24 VDC power supply to allow the LCD and the door mounted control indicators to remain functional when both power sources are dead for extended periods of a time. This module shall contain reverse battery connection indication and circuit protection. | | |
| MANUFACTURER'S RESPONSIBILITY: | | |
| A. The supplier shall be able to provide the services of a field technician to test and demonstrate and train the operating personnel. | | |
| B. The Authority shall have the option of witnessing the demonstration of the system. Notification shall be provided one week prior to the test and demonstration. Submittal shall include specification sheets showing all standard and optional accessories to be supplied: schematic, wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set and the transfer switch. | | |
| C. Each transfer switch shall be provided with an operator's manual providing installation and operating instructions. | | |
| D. Each automatic transfer switch and generator set shall be warranted by the generator set manufacturer for one year from the date placed in service. | | |
| PAINT: | | |
| A. All steel parts shall have the mill scale and oil removed by means of a high-pressure chemical cleaner prior to painting. These surfaces shall be primed with a zinc rich, rust preventive primer. The finish paint shall be a high quality, high solid, polyurethane type enamel. All painting shall be done in | | |

| | COMPLY | |
|--|--------|----|
| | YES | NO |
| conjunction with good commercial practices. | | |
| B. Enclosure Color: Manufacturer's Standard. | | |
| C. Generator and Transfer Switch: Manufacturer's Standard. | | |
| MANUALS/ELECTRICAL DIAGRAM: | | |
| A. One (1) service manual, one (1) parts manual, and one (1) electrical diagram for each unit shall be supplied at time of delivery. | | |
| <u>NOTE:</u> GENERATOR AND TRANSFER SWITCH MUST BE DELIVERED AT THE SAME TIME. NO EXCEPTIONS | | |

[illegible]

Date _____